NOAA Technical Report EDS 15

IFYGL Physical Data Collection System: Description of Archived Data

Washington, D.C.
September 1976

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Environmental Data Service

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IFYGL Physical Data Collection System: Description of Archived Data

Center for Experiment Design
and Data Analysis

Jack Foreman

Washington, D.C.
September 1976

U.S. DEPARTMENT OF COMMERCE
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IFYGL PHYSICAL DATA COLLECTION SYSTEM: DESCRIPTION OF ARCHIVED DATA

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ABSTRACT

This report describes the data obtained by the Physical Data Collection System, a network of towers, buoys, and land stations used during the International Field Year for the Great Lakes (IFYGL) in 1972-73 for limnological and meteorological measurements on Lake Ontario. Sensors used, calibration procedures, and data processing techniques are discussed, and inventories are given of the archived data.

1. INTRODUCTION

During the International Field Year for the Great Lakes (IFYGL), a joint United States-Canadian research program carried out from April 1, 1972, to March 31, 1973, a Physical Data Collection System (PDCS) was established in support of the primary objective of IFYGL: a study of the physical processes related to Lake Ontario and its basin. The U.S. Army Corps of Engineers, Detroit, Michigan, awarded a contract to Texas Instruments, Inc., in 1970 for the design, fabrication, testing, installation, and checkout of the system. In 1971 the National Oceanic and Atmospheric Administration (NOAA) became the U.S. lead agency for IFYGL and monitored the development, construction, and implementation of the system. As a result of these efforts, a network of towers, buoys, and land stations was established for meteorological and limnological measurements on Lake Ontario.

After the field operations, a team was formed at the Center for Experiment Design and Data Analysis (CEDDA) to design the data reduction procedures and to guide computer personnel at NOAA's Lake Survey Center in Detroit in the initial reduction of the PDCS data. Final processing and validation of the data was done at CEDDA.

This report describes system characteristics, calibration procedures, and the techniques used in processing the data, which were placed in a permanent IFYGL Archive at the National Climatic Center in 1974. Requests for data should be addressed to:

IFYGL Data Manager, Room 17
National Climatic Center
National Oceanic and Atmospheric Administration
Federal Building
Asheville, North Carolina 28801

Tel: (704) 258-2850, ext. 754; FTS 672-0754

2. SYSTEM STRUCTURE

2.1 Overview

The IFYGL Physical Data Collection System (PDCS) consisted of 20 meteorological and limnological stations on the United States portion of Lake Ontario. They included 5 land meteorological stations, 2 shallow-water towers, 2 deepwater towers, 10 deepwater buoys, and 1 meteorological station on Galloo Island. The stations were grouped into five subnetworks, as shown in figure 2-1, each around a land station that contained an interrogation unit that acted as a relay for the associated subnetwork. The DECCA coordinates and geographic positions of the stations are listed in table 2-1. Beginning and ending dates of operation for each station are given in table 2-2; a more detailed chronology of events is contained in appendix I.

The Rochester Control Center (RCC), in Rochester, N.Y., served as the control, collection, and relay point for the entire network. Each land station was connected via telephone lines with RCC, which was collocated with land station 28. On the hour and every 6 min thereafter, the RCC real time clock generated a command to begin the station interrogation sequence. Three modes of data transmission were used to interrogate and monitor the network: hard wire, radio link, and telephone lines (fig. 2-2). The data were recorded on magnetic tapes (RCC Weekly Data Tapes) and simultaneously transmitted to the Lake Survey Center (LSC) in Detroit, Mich. The data transmitted to LSC formed the real-time or pre-provisional data base. All stations were equipped with on-board cassette recorders, which served a dual purpose--as backup in case of radio failure or as primary storage where no station radio existed.

Sensors used and parameters measured are listed, by station type, in table 2-3; a detailed inventory of the sensors, including dates of installation and removal, is given in appendix II.

2.2 Station Structure

2.2.1 Land Stations

All land stations were basically the same. A small building housed the electronics, batteries, and telephone interface (fig. 2-3). The main tower supported the sensors and the radio antenna (fig. 2-4). Precipitation stands were positioned at a reasonable distance from the building and from obstructions. The radiometers were also placed a reasonable distance from the building, free from shadows and obstructions. The land station at Rochester contained not only the regular land station equipment but also electronics, additional telephone equipment, and backup power equipment for the Rochester Control Center.

Commercial 110-V, 60-Hz power was used at all the land stations. The lights, telephone equipment, and precipitation gage heater were powered directly; the dewpoint sensor heater was powered via a step-down transformer. The station electronics, including the Land Interrogation Unit (LIU) and the VHF transceiver, were powered by a 12-V, 95 A/hr lead acid storage battery float charged from commercial power.

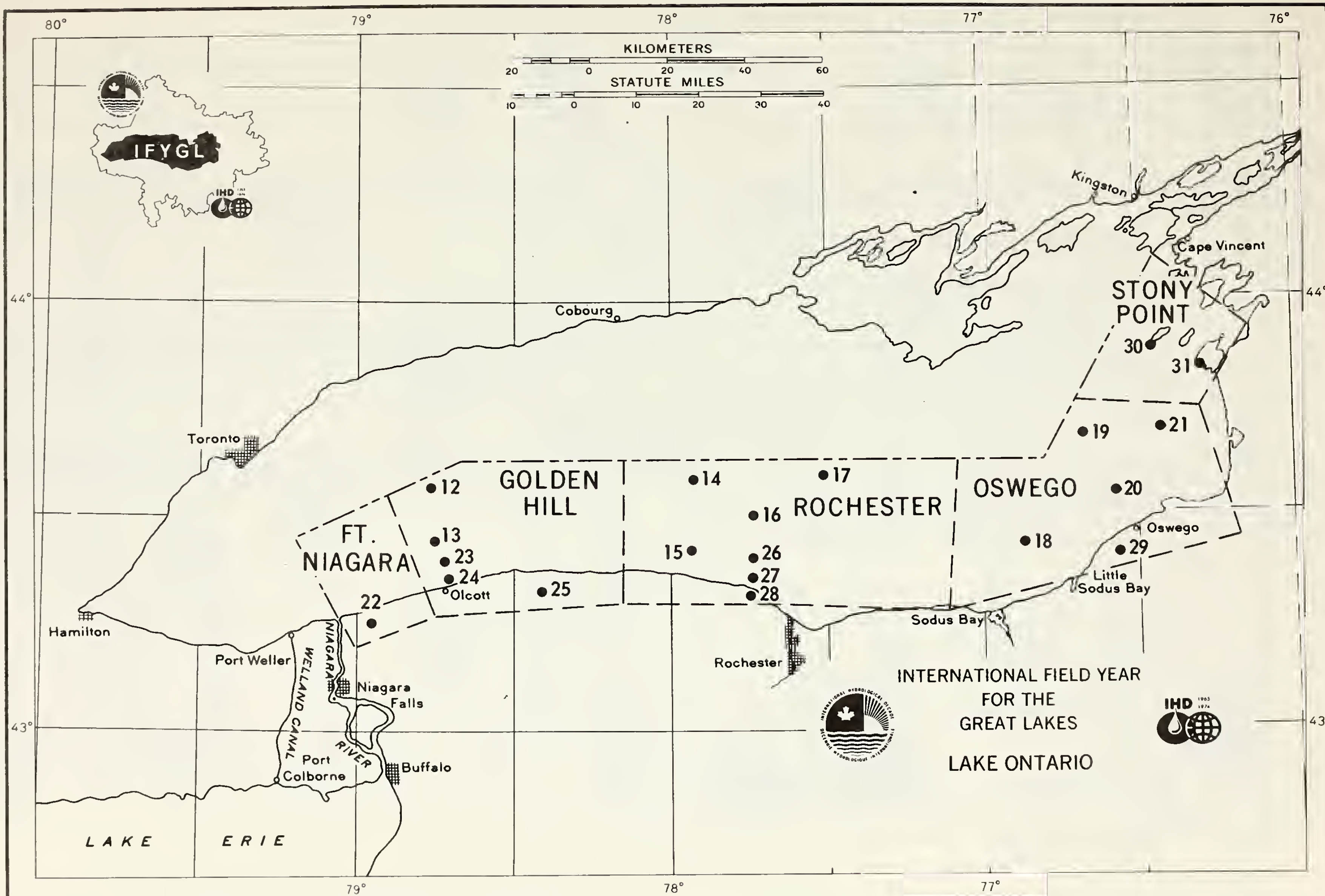


Figure 2-1.--Station locations (IFYGL numbers) with subnetwork breakdowns.

Table 2-1.--DECCA and geographic PDCS station positions

Station No.	Station type	DECCA Red	DECCA Green	Geographic position Lat. N.			Geographic position Long. W.		
12	Buoy	H 16.40	A 39.03	43°	34'	47"	78°	46'	43"
13	"	I 07.88	A 44.80	43	25	59	78	44	15
14	"	D 14.90	B 44.77	43	35	32	78	01	02
15	"	E 10.94	C 39.94	43	25	24	77	56	19
16	"	D 15.05	D 35.24	43	27	36	77	43	54
17	"	C 05.87	E 44.20	43	36	07	77	23	51
18	"	C 13.35	H 32.21	43	26	24	76	56	46
19	"	B 13.33	I 41.94	43	41	41	76	44	36
20	"	B 23.72	I 44.08	43	33	00	76	37	57
21	"	B 12.53	A 30.25	43	41	36	76	26	10
22	Land	-	-	43	16	21	79	00	21
23	Deepwater tower	I 14.88	B 30.05	43	21	26	78	42	49
24	Shallow-water tower	I 16.23	B 30.63	43	20	37	78	42	37
25	Land	-	-	43	22	17	78	29	11
26	Deepwater tower	E 06.06	D 36.75	43	21	42	77	45	17
27	Shallow-water tower	E 08.10	D 37.06	43	20	52	77	45	23
28	Land	-	-	42	20	00	77	45	46
29	"	-	-	43	26	02	76	34	02
30	Island	-	-	45	53	17	76	26	41
31	Land	-	-	43	50	22	76	17	53

Table 2-2.--Periods of operation of PDCS stations

Station No.	Station type	Placed in operation	Operation terminated
12	Buoy	June 13, 1972	Nov. 1, 1972
13	"	May 25, 1972	Nov. 1, 1972
14	"	June 14, 1972	Nov. 17, 1972
15	"	July 18, 1972	Oct. 31, 1972
16	"	May 23, 1972	Nov. 17, 1972
17	"	June 15, 1972	Nov. 18, 1972
18	"	July 19, 1972	Oct. 11, 1972
19	"	June 6, 1972	Nov. 4, 1972
20	"	May 31, 1972	Nov. 4, 1972
21	"	June 7, 1972	Nov. 5, 1972
22	Land	May 9, 1972	Mar. 31, 1973
23	Deepwater tower	June 29, 1972	Nov. 6, 1972
24	Shallow-water tower	June 16, 1972	Oct. 31, 1972
25	Land	May 4, 1972	Mar. 31, 1973
26	Deepwater tower	May 16, 1972	Nov. 28, 1972
27	Shallow-water tower	June 5, 1972	Nov. 16, 1972
28	Land	Apr. 28, 1972	Mar. 31, 1973
29	"	May 2, 1972	Mar. 31, 1973
30	Island	Sept. 27, 1972	Mar. 31, 1973
31	Land	May 11, 1972	Mar. 31, 1973

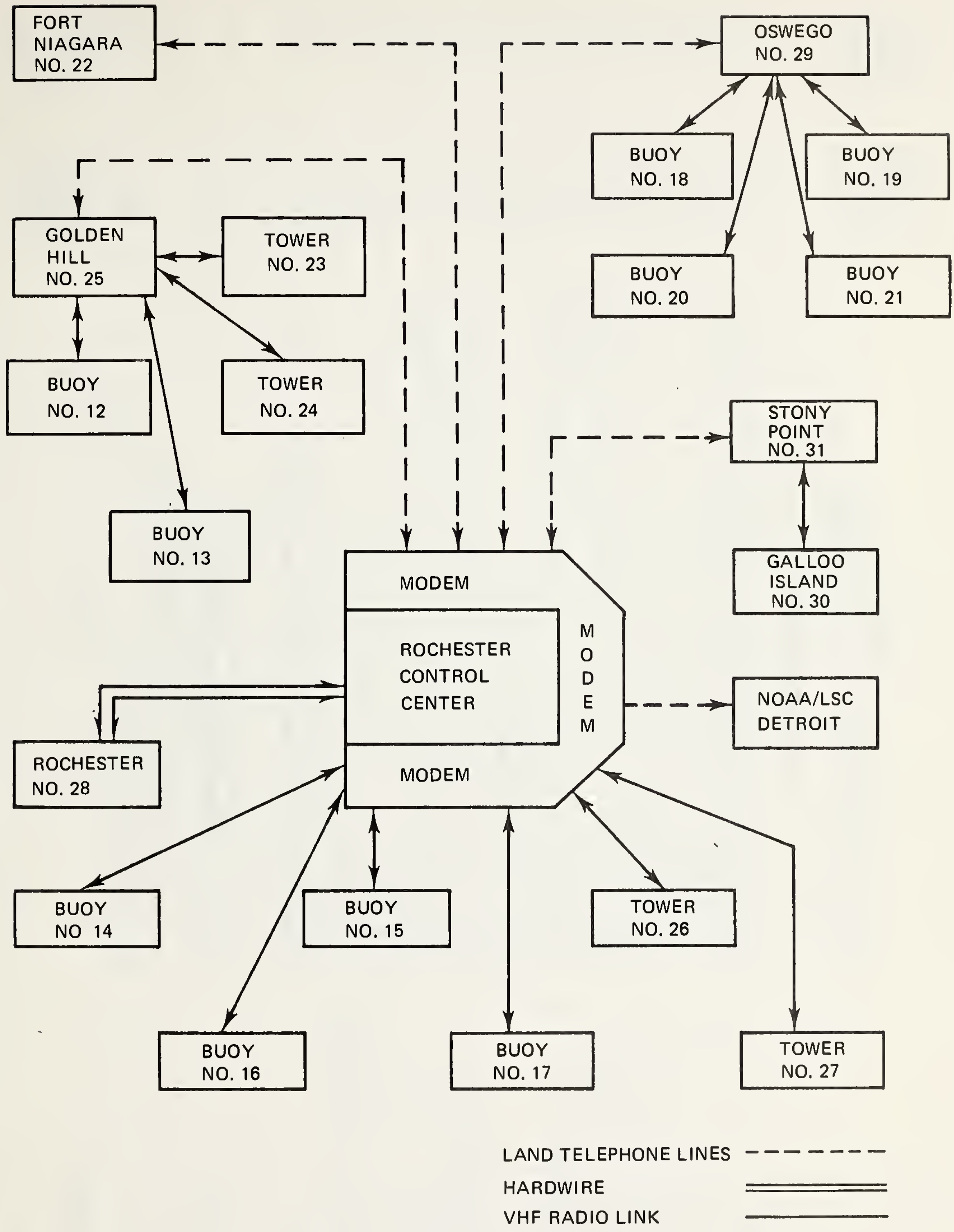


Figure 2-2.--PDCS data transmission flow.

Table 2-3.--Sensors used and parameters measured

Parameter	Sensor	Sensor position No.	Sensor height/ depth
	<u>Land Stations</u>		
Air temperature	Thermilinear element 703 in vane-aspirated shield (Yellow Springs Instruments, 016-10)	01	1.5 m
Wind speed	Cup anemometer (R.M. Young, 6101)	02	10 m
Wind direction	Vane with potentiometric readout (R.M. Young, 6301X)	03	10 m
Atmospheric pressure	Aneroid with potentiometric readout (Sostman, 2014)	05	1.5 m
Dewpoint	Heated LiCl (Foxboro, 2711AG)	06	1.5 m
Incident longwave radiation	Eppley IR	07	2 m
Incident shortwave radiation	Eppley 8-48	09	2 m
Reflected shortwave radiation	Eppley 8-48	10	2 m
Precipitation	Tipping bucket (Weather Measure, P511E)	11	1.5 m
	<u>Shallow-Water Towers</u>		
Current speed	Two-axis propeller current meter (Bendix modified Q-18)	01	2 m
Current direction	"	02	2 m
Current speed	"	03	4 m
Current direction	"	05	4 m

Table 2-3.--Sensors used and parameters measured (continued)

Parameter	Sensor	Sensor position No.	Sensor height/ depth
	Shallow-Water Towers (continued)		
Water temperature	Thermilinear element in epoxy probe (Yellow Springs Instruments, 44202X)	06	1 m
Air temperature	Thermilinear 703 element in vane-aspirated shield (Yellow Springs Instruments, 016-10)	07	3 m
Wind speed	Cup anemometer (R.M. Young, 6101)	09	10 m
Wind direction	Vane with potentiometric readout (R.M. Young, 6301X)	10	10 m
Atmospheric pressure	Aneroid with potentiometric readout (Sostman, 2014)	11	10 m
Dewpoint	Heated LiCl (Foxboro, 2711AG)	13	3 m
Incident longwave radiation	Eppley IR	14	10 m
Incident shortwave radiation	Eppley 8-48	15	10 m
Reflected longwave radiation	Eppley IR	17	10 m
Reflected shortwave radiation	Eppley 8-48	18	10 m
Precipitation	Tipping bucket (Weather Measure, P511)	19	3 m
Water temperature	Thermilinear element in epoxy probe (Yellow Springs Instruments, 44202X)	21	2 m
Water temperature	"	22	3 m
Water temperature	"	23	4 m

Table 2-3.--Sensors used and parameters measured (continued)

Parameter	Sensor	Sensor position No.	Sensor height/ depth
	Deepwater Towers		
Current speed	Two-axis propeller current meter (Bendix modified Q-18)	01	2 m
Current direction	"	02	2 m
Current speed	"	03	5 m
Current direction	"	05	5 m
Current speed	"	06	10 m
Current direction	"	07	10 m
Current speed	"	09	15 m
Current direction	"	10	15 m
Current speed	"	11	19 m
Current direction	"	13	19 m
Incident longwave radiation	Eppley IR	14	10 m
Reflected longwave radiation	Eppley IR	15	10 m
Incident shortwave radiation	Eppley 8-48	17	10 m
Reflected shortwave radiation	Eppley 8-48	18	10 m
Precipitation	Tipping bucket (Weather Measure, P511)	19	3 m

Table 2-3.--Sensors used and parameters measured (continued)

Parameter	Sensor	Sensor position No.	Sensor height/ depth
	Deepwater Towers (continued)		
Water temperature	Thermilinear element in epoxy probe (Yellow Springs Instruments, 44202X)	21	1 m
Water temperature	"	22	2 m
Water temperature	"	23	3 m
Water temperature	"	25	4 m
Water temperature	"	26	5 m
Water temperature	"	27	7 m
Water temperature	"	29	9 m
Water temperature	"	30	11 m
Water temperature	"	31	13 m
Water temperature	"	33	15 m
Water temperature	"	34	17 m
Water temperature	"	35	19 m
Air temperature	Thermilinear 703 element in vane-aspirated shield (Yellow Springs Instruments, 016-10)	37	3 m
Wind speed	Cup anemometer (R. M. Young, 6101)	38	10 m

Table 2-3.--Sensors used and parameters measured (continued)

Parameter	Sensor	Sensor position No.	Sensor height/ depth
	Deepwater Towers (continued)		
Wind direction	Vane with potentiometric readout (R.M. Young, 6301X)	39	10 m
Atmosphere pressure	Aneroid with potentiometric readout (Sostman, 2014)	41	10 m
Dewpoint	Heated LiCl (Foxboro, 2711AG)	42	3 m
	Buoys		
Current speed	Vane-oriented ducted impeller (Bendix, Q-15)	01	5 m
Wind direction	Vane with potentiometric readout (R.M. Young, 35002X)	02	3 m
Wind speed	Cup anemometer (R.M. Young, 6101)	03	3 m
Current direction	Potentiometric readout with reference to magnetic north (Bendix, Q-15)	05	bottom
Current direction	"	06	30 m
Current direction	"	07	15 m
Current direction	"	09	5 m
Current speed	Vane-oriented ducted impeller (Q-15)	10	bottom
Current speed	"	11	30 m
Current speed	"	13	15 m

Table 2-3.--Sensors used and parameters measured (continued)

Parameter	Sensor	Sensor position No.	Sensor height/ depth
	<u>Buoys (continued)</u>		
Air temperature	Thermilinear element 703 with vane-aspirated shield (Yellow Springs Instruments, 016-10)	14	3 m
Dewpoint	Heated LiCl (Foxboro, 2711AG)	15	3 m
Atmospheric pressure	Aneroid with potentiometric readout (Sostman, 2014)	17	3 m
Water temperature	Thermilinear element in epoxy probe (Yellow Springs Instruments, 44202X)	18	5 m
Water temperature	"	19	10 m
Water temperature	"	21	15 m
Water temperature	"	22	20 m
Water temperature	"	23	25 m
Water temperature	"	25	30 m
Water temperature	"	26	35 m
Water temperature	"	27	40 m
Water temperature	"	29	surface
Water temperature	"	30	50 m
Water temperature	"	31	60 m

Table 2-3.--Sensors used and parameters measured (continued)

Parameter	Sensor	Sensor position No.	Sensor height/ depth
	<u>Buoys (continued)</u>		
Water temperature	Thermilinear element in epoxy probe (Yellow Springs Instruments, 44202X)	33	75 m
Water temperature	"	34	100 m
Water temperature	"	35	150 m
	<u>Island Station</u>		
Air temperature	Thermilinear element 703 with vane-aspirated shield (Yellow Springs Instruments, 016-10)	01	1.5 m
Wind speed	Cup anemometer (R.M. Young, 6101)	02	1.5 m
Wind speed	"	03	0.5 m above evaporation pan
Dewpoint	Heated LiCl (Foxboro, 2711AG)	05	1.5 m
Pan evaporation	Pan (Weather Measure) with potentiometric readout (Texas Instruments)	06	---
Air temperature	Thermilinear element 703 with vane-aspirated shield (Yellow Springs Instruments, 016-10)	07	10 m
Wind speed	Cup anemometer (R.M. Young, 6101)	09	10 m

Table 2-3.--Sensors used and parameters measured (continued)

Parameter	Sensor	Sensor position No.	Sensor height/ depth
	Island Station (continued)		
Wind direction	Vane with potentiometric readout (R.M. Young, 6301X)	10	10 m
Atmospheric pressure	Aneroid with potentiometric readout (Sostman, 2014)	11	1.5 m
Dewpoint	Heated LiCl (Foxboro, 2711AG)	13	10 m
Incident longwave radiation	Eppley IR	14	2 m
Reflected longwave radiation	Eppley IR	15	2 m
Incident shortwave radiation	Eppley 8-48	17	2 m
Reflected shortwave radiation	Eppley 8-48	18	2 m
Precipitation	Tipping bucket (Weather Measure, P5111)	19	1.5 m
Water temperature	Thermilinear element in epoxy probe (Yellow Springs Instruments, 44202X)	21	evaporation pan
Water temperature	"	22	1 m

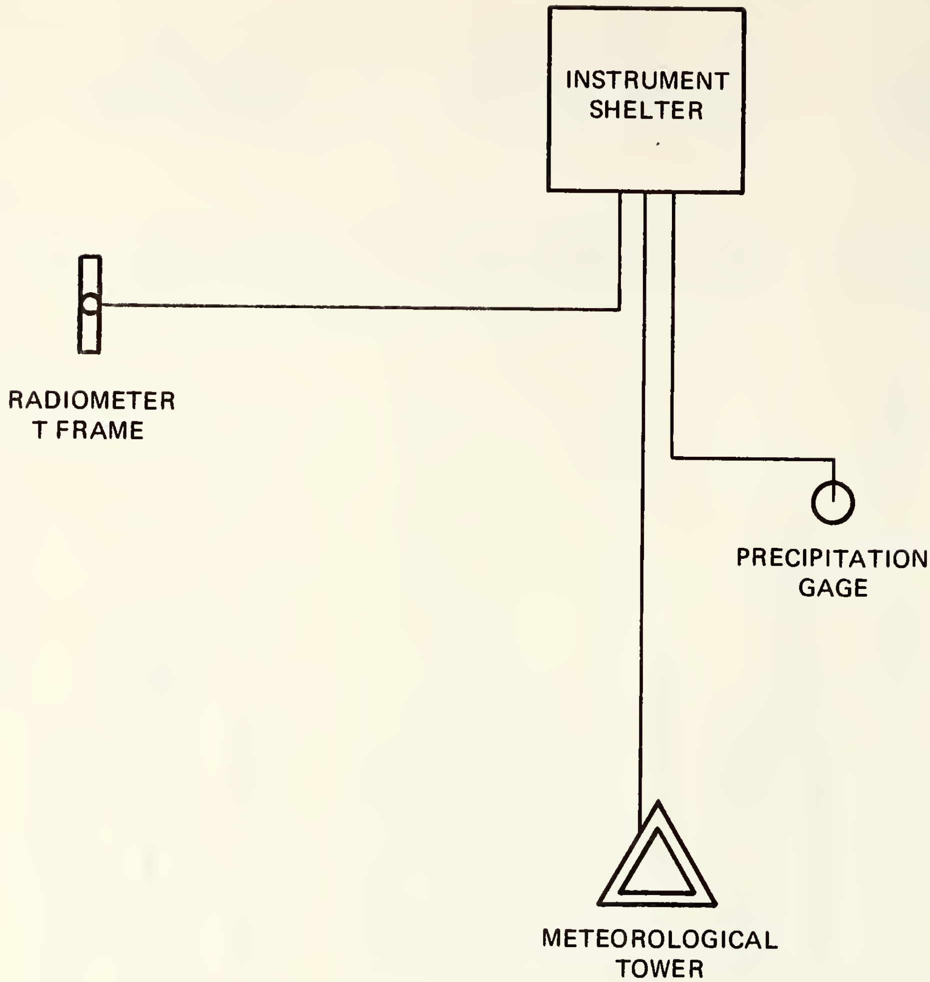


Figure 2-3.--Land meteorological station layout.

Because of RCC's importance, a 3-kW generator was used as an emergency power source. Power transfer was buffered by the storage battery so as not to affect the data during the switching process.

Table 2-4 lists the nominal system design specifications for the various parameters measured by the land stations.

2.2.2 Galloo Island Station

The island station layout (fig. 2-5) was similar to that of the land stations, except for additional sensors. An evaporation pan was mounted on a platform at ground level. The offshore temperature probe was mounted in 2 m of water. The primary source of power was a propane-fueled thermoelectric generator (TEG). Thermal energy was obtained from a catalytic regulator burner. Included in the generator was a burner temperature regulator to improve performance and to prevent inadvertent overheating of the solid-state thermoelectric elements. A d.c. converter and limiter were used with the generator to regulate its output. The TEG supplied a continuous charging current to a

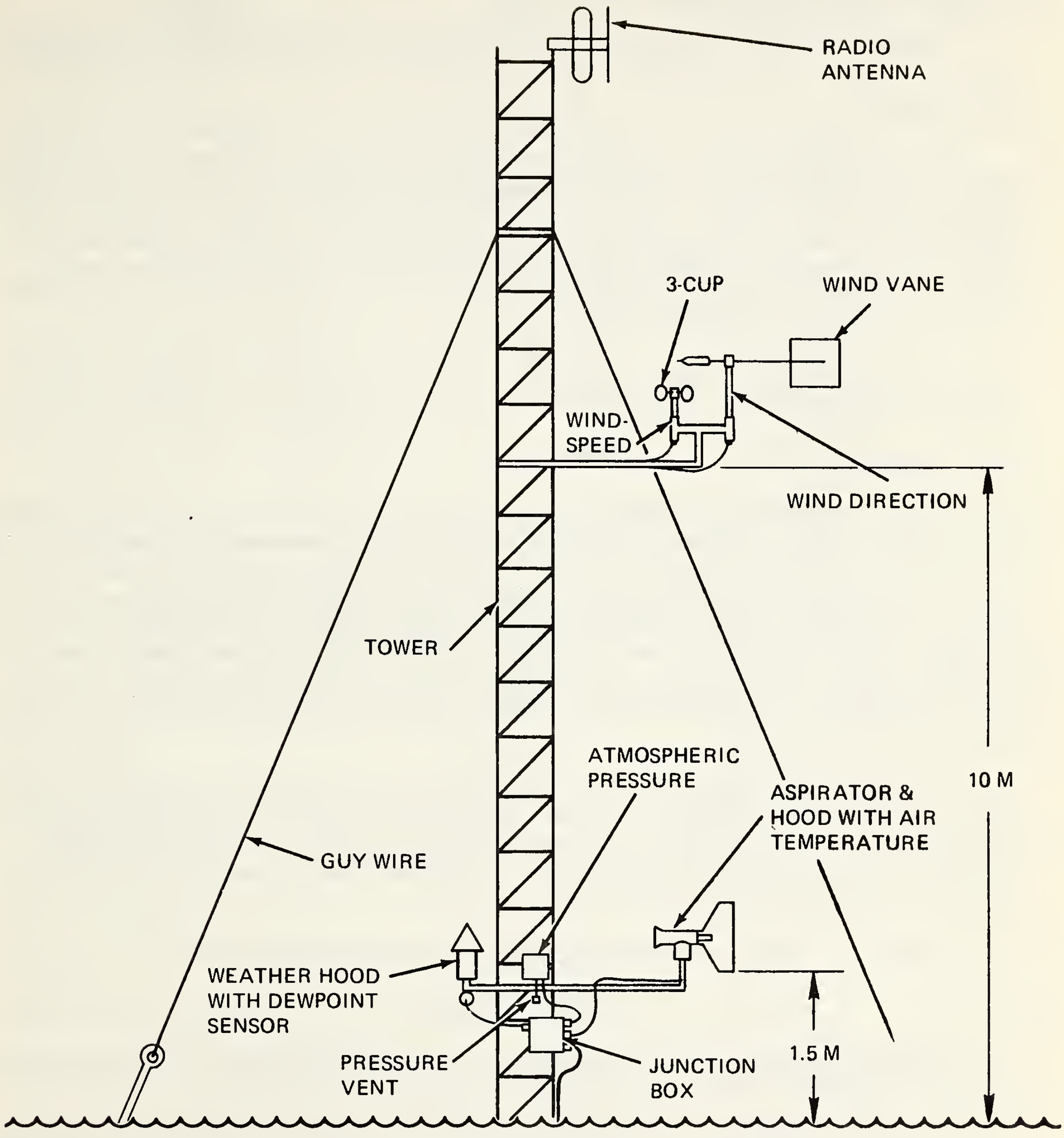


Figure 2-4.--Land meteorological station main tower design.

12-V, 95 A/hr nickel cadmium battery and 25 V a.c. to the dewpoint sensor heater. The battery was sufficient to provide power for all functions (except the dewcell heater) for more than 72 hr.

Table 2-5 lists the design specifications for the parameters measured.

2.2.3 Towers

The offshore shallow-water towers were anchored at a depth of 5 m; the deepwater towers, at 20 m. All the limnological sensors were mounted on the north side of the towers. Two-burner TEG's with an air heat sink were the primary power supply. The TEG's supplied a continuous charging current to a 14.2-V 45 A/hr nickel-cadmium battery and 25 V a.c. to the dewpoint sensor heater. The battery was sufficient to power all functions, except that of the dewcell heater, for more than 72 hr.

Figure 2-6 shows the tower design, and table 2-6 lists the specifications for the parameters measured.

2.2.4 Buoys

The taut-moored, surface-following buoys were anchored at depths from 104 to 184 m. With this mooring, the tension line increased as the drag forces on the buoy increased; hence the sensor cable maintained its vertical orientation under all but extreme weather conditions. Current meters and water-temperature sensors were positioned on the buoy cable at specified levels with reference to the water surface (fig. 2-7). The bottom current meter was expected to be 2.4 m from the bottom under static conditions. Under conditions of moderate wind speeds and currents, the meter was expected to be at the specified 3-m level.

The buoy TEG differed from that on the towers only in that the burner unit was bolted to the bottom of the compartment and was in direct contact with the water. This method of heat-sinking was used to eliminate thermal interaction with the mast-mounted meteorological sensors and to maintain a low center of gravity on the buoy.

Table 2-7 lists the specifications for the parameters measured.

2.3 Sensors

Sensor outputs were of four types: variable resistance, voltage divider, pulses (switch closures/openings), and generated voltage.

With the variable resistance output, the parameter being measured caused the resistance to vary in a well-defined manner. This element was contained in the air and water temperature, and dewpoint sensors.

The dewpoint sensor had a temperature-sensitive element inside a metal tube covered with a wick of woven glass tape. Two parallel gold overlay wires were wound around the wick, which was impregnated with lithium chloride that absorbed moisture from the air, forming an electrically conductive solution. The gold wires acted as electrodes when an alternating current was applied

Table 2-4.--Land station design specifications

Parameter	Range	Allowable error	Resolution
Air temperature	-25 to 40°C	±0.5°C	0.065°C
Atmospheric pressure	950 to 1,050 mb	±0.2 mb	0.125 mb
Wind speed	0 to 50 m/s	±1 m/s	0.10 m/s
Wind direction	0 to 360°	±5°	0.045°
Dewpoint	-25 to 40°C	±1°	0.065°C
Incident longwave radiation	0 to 4 ly/min	±0.05 ly/min	0.02 ly
Incident shortwave radiation	0 to 2 ly/min	±0.05 ly/min	0.01 ly
Reflected shortwave radiation	0 to 2 ly/min	±0.05 ly/min	0.01 ly
Precipitation	0 to 1.6 cm/6 min	±0.025 cm	0.025 cm

Table 2-5.--Galloo Island station design specifications

Parameter	Range	Allowable error	Resolution
Wind speed	0 to 50 m/s	±1 m/s	0.10 m/s
Wind direction	0 to 360°	±5°	0.045°
Air temperature	-25 to 40°C	±0.5°C	0.065°C
Water temperature	-2 to 30°C	±0.2°C	0.032°C
Dewpoint	-25 to 40°C	±1°C	0.065°C
Atmospheric pressure	950 to 1,050 mb	±0.5 mb	0.125 mb
Incident longwave radiation	0 to 4 ly/min	±0.05 ly/min	0.02 ly
Incident shortwave radiation	0 to 2 ly/min	±0.05 ly/min	0.01 ly
Reflected longwave radiation	0 to 4 ly/min	±0.05 ly/min	0.02 ly
Reflected shortwave radiation	0 to 2 ly/min	±0.05 ly/min	0.01 ly
Precipitation	0 to 1.6 cm/6 min	±0.025 cm	0.025 cm
Pan evaporation	0 to 10 cm	±0.02 cm	0.01 cm

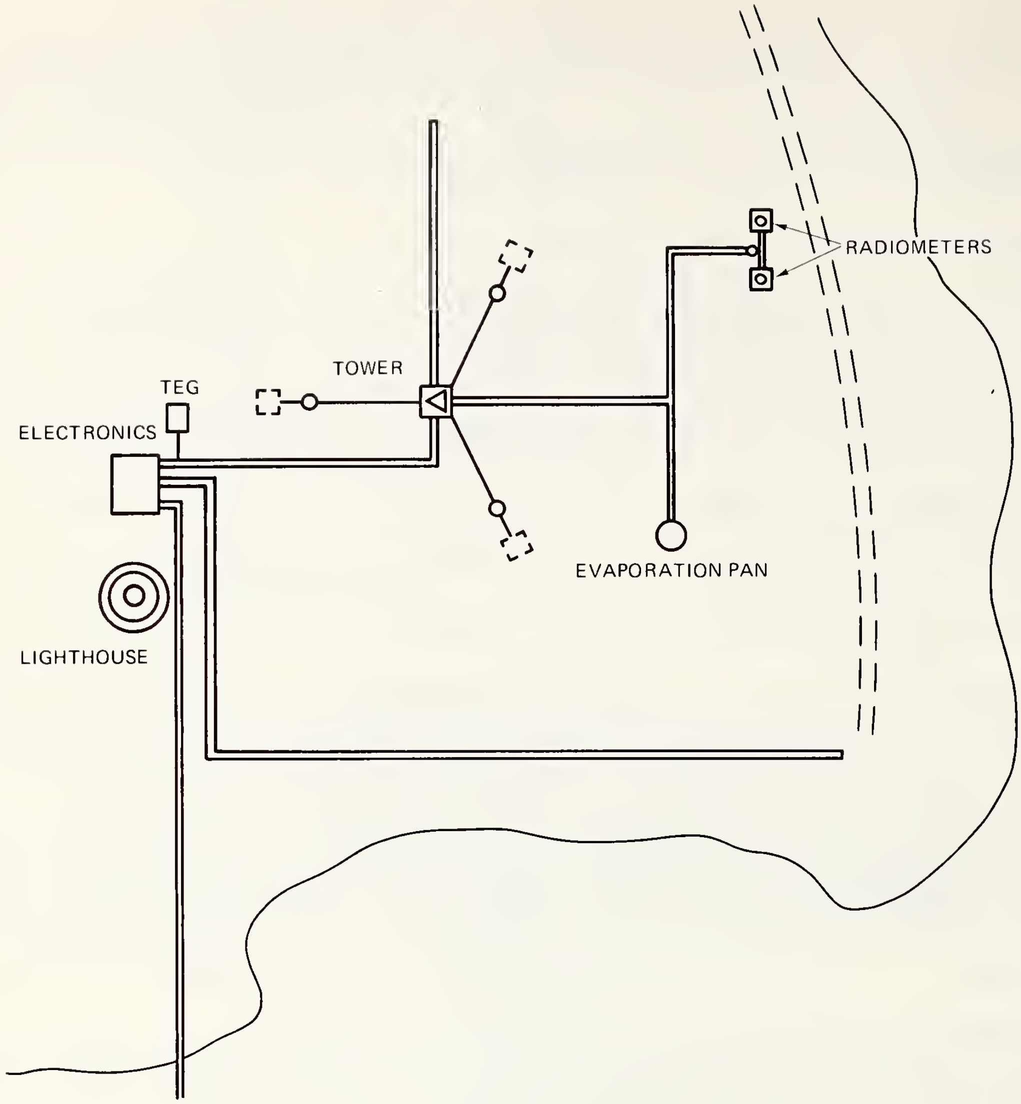


Figure 2-5.--Island meteorological station layout.

(to prevent polarization), the amount of current being dependent on the conductivity of the solution, which in turn was dependent on the moisture retained by the lithium chloride. The current produced heating, the water evaporated, and the lithium chloride dried, terminating the heater current. After this had occurred, the temperature of the lithium chloride and the dewcell was higher than ambient and represented the temperature of equilibrium between the moist air and the lithium chloride-water solution. This temperature was measured and used to compute the dewpoint temperature. The device was considered to be at equilibrium after the first start-up equilibrium point had been reached.

For pan evaporation, air pressure, and wind and current direction, voltage dividers or potentiometers were used, equipped with a wiper or full-scale slide wire. An excitation voltage was applied across the slide wire and the parameter sensed as a voltage with respect to the ground.

Table 2-6.--Offshore tower design specifications

Parameter	Range	Allowable error	Resolution
Air temperature	-25 to 40°C	±0.5°C	0.065°C
Water temperature	-2 to 30°C	±0.2°C	0.032°C
Atmospheric pressure	950 to 1,050 mb	±0.5 mb	0.125 mb
Wind speed	0 to 50 m/s	±1 m/s	0.10 m/s
Wind direction	0 to 360°	±5°	0.045°
Dewpoint	-25 to 40°C	±1°C	0.065°C
Precipitation	0 to 1.6 cm/min	±0.025 cm	0.025 cm
Incident longwave radiation	0 to 4 ly/min	±0.05 ly/min	0.02 ly
Incident shortwave radiation	0 to 2 ly/min	±0.05 ly/min	0.01 ly
Reflected longwave radiation	0 to 4 ly/min	±0.05 ly/min	0.02 ly
Reflected shortwave radiation	0 to 2 ly/min	±0.05 ly/min	0.01 ly
Current speed	0 to +100 cm/s 0 to -100 cm/s	±2 cm/s	0.222 cm/s
Current direction	0 to 360°	±5°	---

On Galloo Island, a still-well configuration was directly coupled to the evaporation pan. A float in the well sensed the water level, so that a change in float level resulted in rotation of the wiper.

Atmospheric pressure at all stations was sensed by an aneroid that mechanically positioned the wiper.

At the land, island, and tower stations, a vane sensed wind direction and positioned the wiper. On the buoys, the vane was positioned by the wind direction, which in turn resulted in the slide wire also being positioned in the direction of the wind. A magnetic compass oriented the wiper, which made contact with the slide wire when a solenoid was actuated. The output was a wind direction value with respect to true north.

The buoy Q-15 current meter sensed current direction with a 4-ft vane, which positioned the slide wire relative to steady-state currents. A magnetic compass oriented the wiper on the slide wire, providing a reading with respect to magnetic north about every 6 min.

On the buoys and towers, precipitation and current speed information was relayed by means of switch openings and closures. These sensors had a

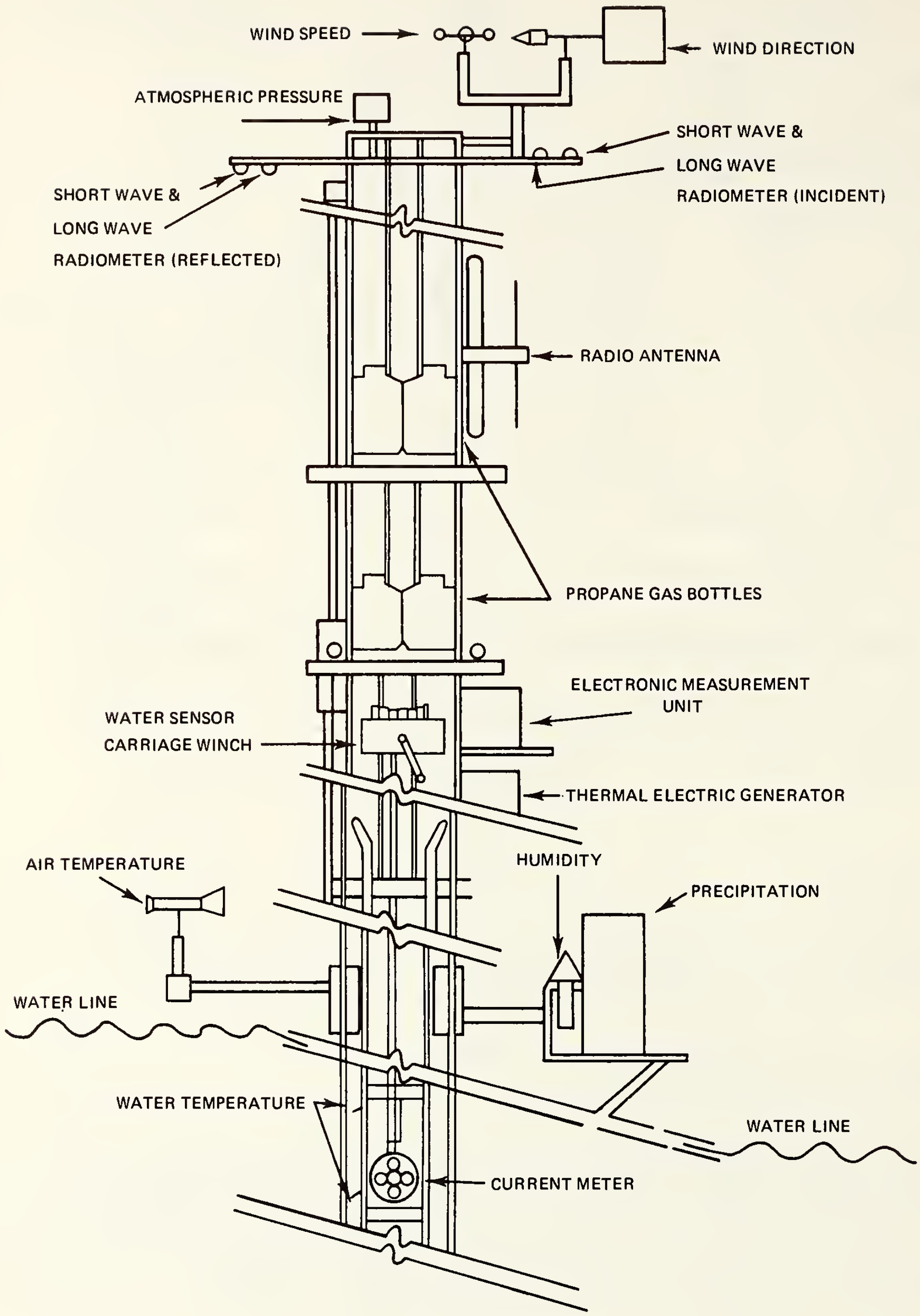


Figure 2-6.--Limnological water station tower.

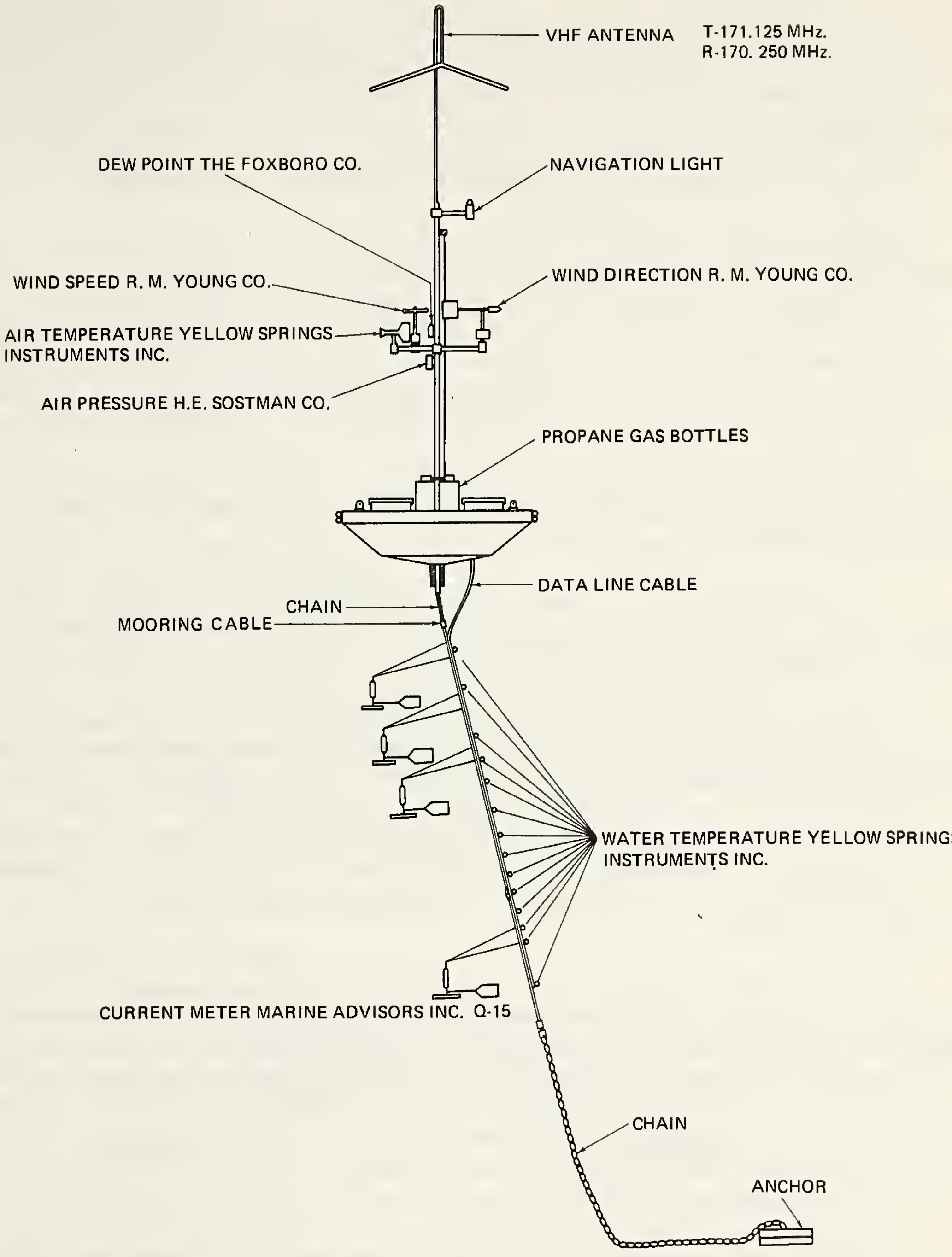


Figure 2-7.--Limnological buoy.

Table 2-7.--Buoy design specifications

Parameter	Range	Allowable error	Resolution
Air temperature	-25 to 40°C	±0.5°C	0.065°C
Water temperature	-2 to 30°C	±0.2°C	0.032°C
Atmospheric pressure	950 to 1,050 mb	±0.5 mb	0.125 mb
Wind speed	0 to 50 m/s	±1 m/s	0.10 m/s
Wind direction	0 to 360°	±5°	0.045°
Current speed	0 to 100 cm/s	±2 cm/s	0.111 cm/s
Current direction	0 to 360°	±5°	0.045°
Dewpoint	-25 to 40°C	±1.0°C	0.065°C

defined relationship between the parameter and the number of pulses per second. The signal conditioning circuitry counted the pulses and converted them to a voltage output.

All precipitation sensors were equipped with a tipping bucket mechanism. When a known amount of water entered the bucket, the mechanism tipped, resulting in a momentary switch closure.

The Q-18 current meters on the towers had two propellers, one above the other, each rotating in either a clockwise or counterclockwise direction, depending on the direction of flow along its axis. Magnets embedded in the shaft of the propeller caused switch closures as the propeller rotated. Each propeller had a switch assembly consisting of two reed switches that closed in a 1-2 or 2-1 sequence, depending on the direction of rotation. The pulse rate provided information on speed, and the switch closure sequence indicated the direction of flow.

In the Q-15 current meter, a ducted impeller sensed the flow along the vane-oriented axis. Magnets embedded in the tips of the impeller blades caused momentary closures of two reed switches as the impeller rotated. The two switches had a closure sequence of 1-2 or 2-1, depending upon the direction of the flow along its axis through the duct. This unit provided a steady-state current speed by averaging out wave effects. A 4-ft vane kept the ducted impeller oriented with respect to the dominant flow. The resulting pulses along a particular axis provided the current speed.

Wind speed and radiation at all stations were measured by d.c. voltage level outputs. Wind speed was sensed by an omnidirectional three-cup anemometer. As the cup assembly rotated, a d.c. tachometer generator provided an output voltage directly proportional to the wind speed.

Limited-band radiation was sensed by the shortwave and longwave radiometers with thermopiles. The nominal sensitivity was 7 mV langley^{-1} min^{-1} for the shortwave and 5 mV langley^{-1} min^{-1} for the longwave sensor.

3. CALIBRATION

The IFYGL PDCS sensors were calibrated separately from the electronics. NOAA's National Oceanographic Instrumentation Center (NOIC) calibrated the limnological sensors before deployment, and all sensors after the end of the Field Year. During the operational phase, a calibration laboratory, manned by NOIC personnel, was established at the Rochester Control Center (RCC). All electronics were calibrated at the RCC facility.

To the extent possible, sensors were also rotated through the RCC laboratory for calibration or replacement. A special rotation procedure was designed to provide information on the aging of the delicate atmospheric pressure sensors. To determine the amount of change, attributed to sensor handling, one sensor was used as a control and was calibrated repeatedly. A precise pressure gage, calibrated by the National Weather Service in August 1972 and April 1973, was used as the standard in calibrating the pressure sensors.

All wind speed sensors were checked at RCC against a reference sensor. This sensor, as well as seven other ones, were calibrated in December 1972 in the University of Michigan wind tunnel.

The Q-15 current meters were calibrated in air before deployment, and their condition therefore had to be checked before postcalibration. Sensors that showed poor spin or threshold tests were cleaned with soap and water, without being disassembled, and retested. Sensors that did not pass the check because of bad reed switches were not tested further. All Q-18 current meters were fouled on retrieval and had to be cleaned before postcalibration.

All dewpoint sensors were given one-point operational checks before deployment and at the end of the Field Year.

3.1 NOIC Calibration Procedures

3.1.1 Water Temperature Sensor

The thermistors were calibrated in ladder arrays. The wire lengths and connections represented variable quantities during calibration and deployment. The calibration results confirmed that the variations were within sensor specifications. The test equipment was as follows:

Equipment	Specification
Digital multimeter	± 0.01 percent of reading
Decade resistance box	± 0.02 percent of reading
Digital power supply	± 0.0001 V d.c.
Quartz thermometer	± 0.02 percent of reading
Mueller bridge	± 0.001°C
Test jig	---
Constant temperature bath	---

The digital multimeter at ±0.01 percent of maximum voltage introduced an uncertainty of ±0.0002 V, or ±0.02°C. The decade resistance box introduced a ±0.014°C uncertainty; the digital power supply, which was constantly

monitored, a ±0.01°C uncertainty. The quartz thermometer was used to control the constant temperature of both with a resolution of ±0.001°C. The Mueller bridge had an accuracy of ±0.001°C. The constant temperature bath was held to ±0.003°C between 15°C and 25°C and to ±0.005°C above and below these points. Thus the maximum error introduced by the calibration equipment was ±0.050°C. Subsequent test results indicated a true variation of less than half of this amount.

3.1.2 Q-15 Current Meter

The Q-15 meter measured both current speed and direction. Speed was measured by a plastic five-blade propeller mounted in a cylindrical housing with a reed switch. Direction was measured by a fiberglass vane at the end of a boom mounted to the propeller housing. The vane assembly turned the unit into the direction of flow. Within the unit was a magnetic compass and a three-terminal potentiometer. The magnetic compass oriented itself and the resistive segment of the potentiometer with respect to true north, regardless of the physical position of the meter. The potentiometer was connected directly to the boom. In this configuration, the resistance between the rotating arm and either end of the potentiometer was directly related to the orientation of the vane.

During calibration, the resistance bridge specification was ±0.5°, the magnetic compass uncertainty was ±3.6° and the test jig introduced a ±2° uncertainty. The total uncertainty assigned to the test equipment was 6.1°. Since all tests were static in nature, the uncertainty of the sensor was set at 4°, giving a total uncertainty of 10°.

3.1.3 Q-18 Current Meter

The Q-18 current velocity impeller consisted of two orthogonally mounted five-bladed propellers. Imbedded in the impeller unit were four permanent magnets, with a reed switch positioned to be activated by them. The reed switches were arranged to indicate forward or reverse direction of flow.

The following static tests were conducted:

(1) The reed switch was checked.
(2) An oscilloscope checked the rise and fall characteristics of the reed switch.
(3) A spin-down test provided a chart representing the mechanical deceleration of the unit.
(4) A threshold test provided a check on the amount of friction necessary to be overcome for sustained rotation.

3.1.4 Atmospheric Pressure Sensor

The atmospheric pressure unit consisted of a bellows assembly in a compartment vented by a single opening whose dimensions changed with pressure. This dimensional change was translated into mechanical motion which moved a knife-edge wiper across a potentiometer. The following test equipment was used:

Equipment	Specification
Digital multimeter	± 0.01 percent of reading ± 0.05 percent of ratio
Precision pressure gage	± 0.1 mb
Manometer	---
Test jig (switching)	---
Vacuum/pressure pump	---
Assorted clamps, tees, and hoses	---

The digital multimeter ratio introduced an uncertainty of from ±0.01 mb at 0.05 percent of ratio to ±0.07 mb at 0.95 percent of ratio. The precision pressure gage was assigned an accuracy of ±0.10 mb. The combined uncertainty from these two sources amounted to a maximum of ±0.17 mb, constituting only a degree of uncertainty, not an actual error.

Each sensor was considered unfit for deployment only in case of serious failure, e.g., open leads, jammed bellows, and the like.

3.1.5 Air Temperature Sensor

The air temperature sensor was a three-wire thermolinear unit with two internal thermistors and two external resistors that linearized the output across either a resistor, a thermistor, or a combination of them, when a constant voltage was applied to both in series. The voltage across the component-resistor combination decreased as temperature increased. The resistor values were selected to make the output nearly linear for the range of the sensor.

The test equipment was as follows:

Equipment	Specification
Digital multimeter	± 0.01 percent of reading
Decade resistance box	± 0.02 percent of reading
Digital power supply	---
Quartz thermometer	± 0.02 percent of reading
Mueller bridge	± 0.001°C
Test jig for switching	---
Constant temperature bath	---

The digital multimeter at ±0.01 percent of a maximum of 2,000 V introduced an uncertainty of ±0.015°C. The decade resistance box introduced an uncertainty of ±0.016°C. The digital power supply was constantly monitored, at less than ±0.008°C. The quartz thermometer reading was not used. The platinum thermometer-Mueller bridge combination with corrections had an accuracy of ±0.001°C. The constant temperature bath, manually controlled by a skilled operator, could be held at ±0.003°C at relatively ambient temperatures of 15°C to 25°C. Above or below these points, 0.005°C could be maintained. The switching jig introduced no error.

Combined, the multimeter, the decade resistance box, and the power supply give an uncertainty of 0.039°C, with an additional 0.006°C introduced

by the platinum thermometer and the temperature bath. The test results indicated a variation of less than half this amount.

3.1.6 Wind Direction Sensor

At the land, tower, and island stations, the wind direction sensor had two main sections. One was the direction sensing unit: the vane, shaft, hub, and counterweight. The first two were attached permanently; the last two could be positioned for proper balance. The other section was the housing, the top half of which contained a vertical shaft and bearing assembly terminating in a fork portion of a flexible coupling. In the bottom half was the bristle brush portion of the flexible coupling, the potentiometer, and the electrical connector assembly. The connector assembly also locked the unit to the correct compass heading.

The wind forced the vane to turn the vertical shaft and counterweight to face into the wind, and the vertical shaft physically turned the potentiometer arm to its proper position relative to this heading. The potentiometer leads terminated in the connector, which also served as a clamp to position the unit.

The test equipment was as follows:

Equipment	Specification
Test jig adapter	± 1.5°
Mechanical orienting test jig	± 1.5°
Digital power supply	---
Digital voltmeter	± 0.05 percent of scale
Digital voltmeter	± 0.01 percent of scale
Wiring harness	---

The test equipment uncertainty was in the test jig and adapter, assigned a maximum error of ±1.5°. The digital power supply and the digital voltmeter contributed negligible errors; the wiring harness introduced no error. The sensor uncertainty, 0.5 percent linearity, was determined from the manufacturer's statement. Another 1 percent for overall accuracy was included, giving a total of ±1.5 percent or approximately ±5.5° of arc. The total test uncertainty was ±7.0°.

The buoy wind direction sensor also consisted of two major segments: the sensing unit (vane, shaft, hub, and counterweight); and the housing. The housing contained the vertical shaft, the magnetic compass unit, slip ring assemblies, the electrical conector, and the mounting bracket. The vane was connected to a vertical shaft, which was connected in turn to the wiper arms of a potentiometer. The resistive segment of the potentiometer was connected to a magnetic compass. To keep the compass as free from friction as possible, the wiper arm made contact with the potentiometer winding only when activated by a solenoid. Once activated, there was no change in reading until the solenoid was deactivated. The potentiometer leads were connected to the slip rings on the compass, which allowed the unit to rotate freely whether or not the solenoid was activated.

The following test equipment was used:

Equipment	Specification
Mechanical orienting test jig	± 2°
Electronic test jig	---
Magnetic compass	1 percent of reading
Resistance bridge	± 0.15 percent of reading
Multimeter	---

The total uncertainty in the test equipment was 6.1°, based on the possible uncertainty of ±2° of the test jig; the magnetic compass specification of 1 percent, which translates to a maximum error of 3.6°; and the resistance bridge specification of 0.15 percent, which equals a maximum error of 0.5°. The multimeter monitored the solenoid current to assure its operation and had no effect on the results.

The manufacturer assigned a dynamic accuracy of ±5° to the sensor. Since all laboratory tests were of a static nature, the uncertainty of the sensor for this test was arbitrarily set at 4° of arc, yielding a total uncertainty of 10° of arc. If a sensor did not meet this criterion, it was considered to have an improper response.

3.1.7 Wind Speed Sensor

The wind speed sensor was a three-cup anemometer, consisting of the cup assembly, bearings, and a d.c. generator. The bearing assembly maintained the relationship of the cup assembly and the flexible coupling. The bearing assembly shaft terminated in a two-prong fork. The d.c. generator had a bristle brush wheel that formed the second segment of the flexible coupling, which, along with the fork portion of the bearing assembly, absorbed sudden changes in wind velocity. The generator was adjusted by the manufacturer to have an output of 2,400 mV at 1,800 rpm, or 50 mi/h.

The test equipment was as follows:

Equipment	Specification
Digital voltmeter	± 0.05 percent of scale
Variac	---
Digital multimeter	---
Decade resistance box	0.15 percent of reading
Wind tunnel (modelled)	± 10 mV at anemometer output
Test jig (switching)	---
Anemometer	± 1 m/s

The digital voltmeter at ±0.05 percent of maximum voltage introduced an uncertainty of ±0.0005 V in the 1,000-V range and ±0.005 V in the 10-V range. The wind tunnel introduced an uncertainty of ±10 mV in the anemometer output due to perturbations in wind speed. The anemometer was assumed to meet all the manufacturer's specifications and its output vs. wind speed was used as a standard. All the other components did not contribute to the uncertainty of test results.

The uncertainty in the sensor was determined prior to any testing, partly from the manufacturer's specifications. If the data did not fall within the sum of the maximum uncertainties of the test equipment and sensor, the latter was considered faulty. The uncertainty in the sensor was arbitrarily placed at 3 percent of reading and an additional uncertainty of -0.5 mi/h was added because of the manufacturer's statement that the threshold was between 1.0 mi/h and 1.5 mi/h. Using the manufacturer's assumption that the friction causing the threshold is the same for all cup-wheel speeds, an anemometer with readings of 0.5 mi/h less than the standard test unit was considered valid. The total uncertainty with respect to the standard anemometer was -0.5 mi/h ± 10 mV ± 3 percent of reading. In terms of mV, the total uncertainty was -22.92 mV ± 10 mV ± 3 percent of reading.

In determining the theoretical response of the R. M. Young (Model No. 6101) wind speed sensor used as the standard test unit in the RCC laboratory the following assumptions were made:

(1) One revolution of the cups corresponds to 2.4 ft of wind passage.
(2) The threshold of the instrument is 1.0 mi/h. The friction loss is in the bearings and generator assembly, and the magnitude of the friction loss is constant at all cup-wheel speeds.
(3) The relationship between output voltage and wind speed is linear above threshold.
(4) Generator output at 1,800 rpm is 2,250 mV.

The above assumptions are illustrated in figure 3-1.

The equation describing the response in meters/sec can be found from

$$\text{Speed} = m(\text{Voltage}) + b \quad ,$$

where

$$m = \frac{\Delta\text{Speed}}{\Delta\text{Voltage}} = \frac{22.3926 - 0.4470}{2250 - 0} = 0.0097536 \quad ,$$

and

$$b = 0.4470 \quad .$$

The following conversion factors were used:

$$1 \text{ m/s} = 2.2369 \text{ mi/h} = 82.0210 \text{ rmp} = 102.5263 \text{ mV} \quad .$$

The only graph available of an actual unit calibration represented the output at 1,800 rpm to be 2,250 mV. This was used as a base point for all data and conversions were worked out around it. However, the IFYGL calibration tests gave an output of 2,400 mV at 1,800 rpm. This test was added during the postcalibrations. Since all the tests could not be rerun and any attempt to reconvert the data would have been fruitless, no change was made.

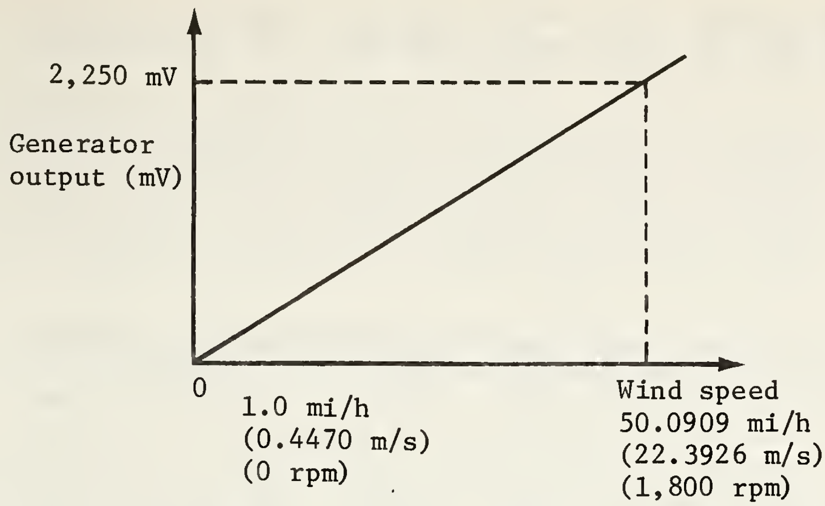


Figure 3-1.--Graph of theoretical response of wind speed sensor.

3.2 Electronics Calibrations

3.2.1 Performance Checks

In the performance checks of the electronics, done at the Rochester Control Center (RCC), the analog circuitry was calibrated, and the digital circuitry, the internal calibration feature, and the recorder and radio were checked. Most of the effort involved the analog circuitry and the analog-to-digital (A/D) conversion. Performance checks were made both before and after deployment.

Input to the electronics calibration were accurately known values simulating a sensor, and the output was a three-digit raw data number. Since the design relationships between the inputs and outputs were known, the measured output and calculated output could be matched.

If after the predeployment performance check the measured output and calculated output were not identical, they were adjusted to coincide. During the postretrieval performance check, if the measured and calculated outputs were not the same, no adjustments were made. The actual measured output and internal calibration data were recorded.

The sensors were simulated by a variable resistance, a voltage divider, and a pulse generator or a voltage generator. An impedance bridge, voltmeter, and frequency counter were used as standards. The specifications are listed in table 3-1.

For air and water temperature, 10 resistors, connected to simulate the sensor, were measured by the impedance bridge, and the resistor values were recorded. As each resistor was connected, the voltage, V_{in} (measured), and a three-digit field test interrogation unit (FTIU) readout of measured data (MD) was recorded. The calculated input voltage, V_{in} (calc), was determined by multiplying the input resistance ratio by the excitation voltage. The FTIU readout of calculated data (CD) was determined from the calculated input

Table 3-1.--IFYGL data collection network specifications

Parameter	Range	Equivalent analog signal at A/D (V)	Digital signal at FTIU	Allowable error	Equivalent counts	
					counts	mV
Water temperature (°C)	-2 to 30	0 to 10.00	000-001 to 998-999	±0.2	±6	±60
Air temperature (°C)	-25 to 40	0 to 10.00	000-001 to 998-999	±0.5	±7	±70
Dewcell (°C)	-2.2 to 94.1	0 to 10.00	000-001 to 998-999	±1.5	±15	±154
Water current speed--buoy (cm/s)	0 to 100	0 to 9.00	000-001 to 899-900	±2.0	±18	±180
Water current direction--buoy (°)	0 to 358	0 to 8.00	000-001 to 799-800	±5.0	±11	±110
Water current--tower (cm/s)	-100 to 100	0.5 to 9.50	050-051 to 950-951	±2.0	±9	±90
Wind speed (m/s)	0 to 50	0 to 4.86	000-001 to 485-486	±1.0	±9	±90
Atmospheric pressure (mb)	950 to 1,050	0 to 8.00	000-001 to 799-800	±0.5	±4	±40
Wind direction (°)	0 to 355	0 to 8.00	000-001 to 799-800	±5.0	±11	±110
Longwave radiation--incident/reflected (ly/min)	0 to 4	0 to 2.00	000-001 to 200-201	±0.05	±3	±25
Shortwave radiation--incident/reflected (ly/min)	0 to 2	0 to 2.00	000-001 to 200-201	±0.05	±5	±50
Precipitation (cm)	0 to 1.6	9.99 to 0	999-998 to 001-000	±0.025	±16	±160

voltage and the parameter transfer function. The difference between CD and MD indicated how the electronics performed with respect to the design response.

The procedure for the dewpoint channel was different from the above because of significant resistance in the test leads. To account for this resistance and standardize the testing, a potentiometer was connected in series with the test leads and adjusted until the loop resistance in the test leads and harness wiring to the circuit board was an exact value. This value was 2.000 ohms for the land stations and 5.000 ohms for the buoys.

The air pressure, wind direction, and current direction sensors were connected to their respective channels by potentiometers with a wiper arm electrically connected directly to the A/D converter without any signal-conditioning circuitry. A voltage divider was used to simulate each sensor. Since calibrating each of these channels would have been redundant, air pressure was chosen as representative. Ten voltages were input, and the output was recorded and calculated for corresponding inputs. The other channels were given one-point checks to ensure proper operation.

The current speed sensor was simulated as pulse generators. The sensor electronics had to determine speed and direction depending on the rate and phase of switch closures. A test jig was used to simulate the switch assembly. A square-wave generator was connected to the test jig, with a counter to measure the wave's period and a switch to reverse the switch closure's phase. The square wave's period was recorded as input, from which MD was obtained; CD was calculated.

The precipitation sensor was simulated by switch closures. The calibration of this channel consisted of groups of closures and interrogations to determine MD, and CD was calculated as a function of the number of closures.

The radiation sensor could be simulated as a voltage source. An equivalent variable voltage source was set up with a Darcy voltmeter measuring the circuitry input. Fifteen known voltages were input and recorded together with MD; CD was calculated as a function of the input voltage. Since all radiometers had different response coefficients, the equivalent radiation parameter was not calculated.

The wind speed sensor was a d.c. generator and was simulated as a voltage source. Because the sensor produced voltages of large magnitudes, no signal-conditioning circuitry was needed and the output was directly connected to the A/D converter. As with other direct input channels, this one was given a one-point check to ensure its performance; MD was recorded and CD calculated.

3.2.2 Internal Calibrations

After the performance checks by sensor simulation had been completed, the internal calibrations were read out and input to the computer as design calibrations.

Variations in the internal calibration values were attributed to either a change in the signal-conditioning circuitry or a change in the internal calibration circuitry. To determine the cause, the change in internal calibration

values was compared with the change of errors in the preperformance and post-performance checks. If the changes were equal, the variations in the internal calibrations were probably the result of signal-conditioning circuitry changes. If the changes were not equal, they were attributed to variations in both the internal calibration and the signal-conditioning circuitry.

3.2.3 Derivation of Performance Check Equations

The water temperature sensor can be simulated as shown in figure 3-2.

From the manufacturer's specifications,

$$V_{in} = E\,(AT + B) \quad , \tag{3-1}$$

where

$A = -0.0056846$,
$B = 0.805858$,
$T =$ temperature (°C)
$E = -2.000$ V, and
$R_1 = 5{,}7000$ ohms.

The system specifications state that the temperature range of -2 to 30°C should be equivalent to a data range of 000 to 1,000 units. To determine the relationship between CD and R_T, let

$$CD = mV_{in} + b \quad , \tag{3-2}$$

where

$$m = \frac{\Delta CD}{\Delta V_{in}} = 2748.654 \quad , \tag{3-3}$$

and

$$b = CD - mV_{in} = 4492.550 \quad . \tag{3-4}$$

Representing V_{in} as a function of R_T gives

$$V_{in} = \frac{ER_T}{5.7 + R_T} \quad . \tag{3-5}$$

Substituting eqs. (3-3), (3-4), and (3-5) into (3-2), we obtain

$$CD = \frac{-5497.372}{5.7 + R_T} + 4492.614 \quad . \tag{3-6}$$

The water temperature can be found by rewriting eq. (3-1) and substituting the above values, i.e.,

$$T = 141.761 \; \frac{-175.914\; R_T}{5.7 + R_T} \quad . \tag{3-7}$$

Derivation of the performance equation for the evaporation pan water temperature was similar to the above, except that the temperature range was -2 to 40°C. Therefore, from eqs. (3-3) and (3-4),

$$m = 2094.213 \quad ,$$

and

$$b = 3422.895 \quad .$$

From eqs. (3-2), (3-5), and the above, we obtain

$$CD = \frac{-4188.426\ R_T}{5.7 + R_T} + 3422.895 \quad , \tag{3-8}$$

from which the water temperature can be calculated by means of eq. (3-7).

The buoy air temperature sensor can be simulated as shown in figure 3-3. According to the manufacturer,

$$V_{in} = E\ (AT + B) \quad , \tag{3-9}$$

where

R_1 = 18,700 ohms,
E = -2.000 V,
A = -0.0067966, and
B = 0.605107.

The temperature range of -25 to 40°C is equivalent to a range of 000 to 1,000 raw units. The relationship between CD and R_T can be determined from eq. (3-2), where

$$m = 1131.788 \quad ,$$

and

$$b = 1858.361 \quad .$$

Substituting V_{in}, m, and b into eq. (3-2) gives

$$CD = \frac{-2263.575\ R_T}{18.7 + R_T} + 1858.361 \quad . \tag{3-10}$$

Solving eq. (3-2) for T and substituting the values for A and B, we obtain

$$T = 95.793 - \frac{147.132\ R_T}{18.7 + R_T} \tag{3-11}$$

The land station air temperature sensor can also be simulated as shown in figure 3-3, where

E = 1.46 V,
R_1 = 18,700 ohms,
R_2 = 821.9 ohms,
R_3 = 178.1 ohms, and
Gain = 15.384

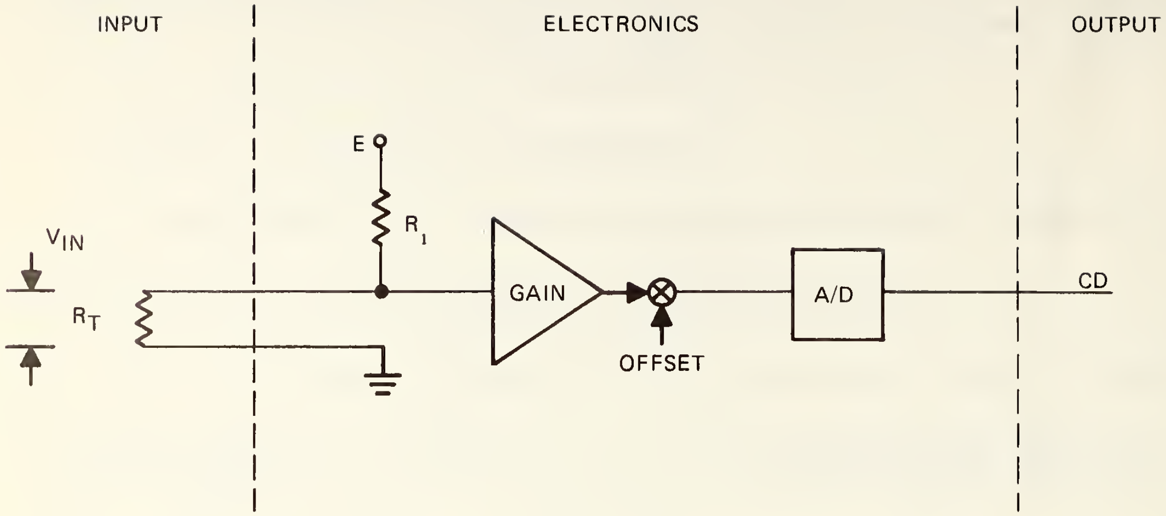


Figure 3-2.--Representation of water temperature sensor.

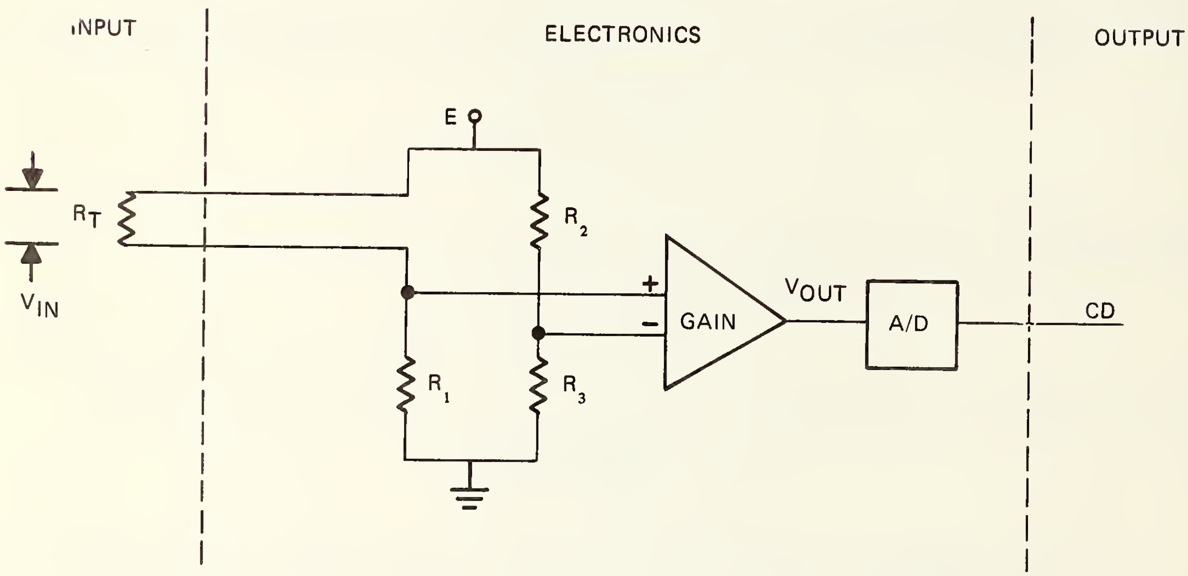


Figure 3-3.--Representation of buoy and land station air temperature sensor.

Solving the circuit diagram for CD and making the appropriate substitutions gives

$$CD = \frac{42001.397}{18.7 + R_T} - 400.02 \quad , \qquad (3\text{-}12)$$

and

$$V_{in} = \frac{1.46\ R_T}{18.7 + R_T} \quad . \qquad (3\text{-}13)$$

The buoy dewpoint sensor can be simulated as shown in figure 3-4, where

$E = 8.00$ V,
$R_1 = 1{,}003$ ohms,
$R_2 = 316.5$ ohms,
$R_3 = 5.00$ ohms,
Gain = 114.69214, and
Offset = -109.702914.

Solving the above, we obtain

$$V_1 = \frac{ER_2}{R_1 + R_2 + \dfrac{R_1 R_2}{R_D + R_3}} \quad , \qquad (3\text{-}14)$$

$$CD = 100\ (V_{21}\ \text{Gain} + \text{Offset}) \quad , \qquad (3\text{-}15)$$

and

$$V_{in} = \frac{ER_2}{R_1 + R_2 + \dfrac{R_3\ (R_1 + R_2) + R_1 R_2}{R_D}} \quad . \qquad (3\text{-}16)$$

The land station dewpoint sensor can be simulated as shown in figure 3-5, where

$E = 2.45$ V,
$R_1 = 258.194$ ohms,
$R_2 = 4753.1$ ohms,
$R_3 = 5246.9$ ohms, and
Gain = 86.6,

from which we obtain

$$V_1 = \left(\frac{R_2}{R_2 + R_3} - \frac{R_D}{R_1 + R_D}\right) E \quad , \qquad (3\text{-}17)$$

and

$$CD = 100\ (86.6 V_1) \quad . \qquad (3\text{-}18)$$

Substitution into eq. (3-18) gives

$$CD = 11132.348 \frac{-5478102}{258.194 + R_D} \quad , \tag{3-19}$$

which describes the channel when R_D is actually the dewpoint sensor. The lead resistance cannot be neglected in the performance check however, and a 2-ohm potentiometer was inserted. Therefore, eq. (3-19) needs to be modified by replacing R_D by R_D + 2.000, i.e.,

$$CD = 11132.348 - \frac{5478102}{260.194 + R_D} \quad , \tag{3-20}$$

and

$$V_{in} = \frac{2.45 \ R_D}{260.194 \ R_D} \quad . \tag{3-21}$$

The air pressure channel can be simulated as shown in figure 3-6. Since a 10-mV input to the A/D represents one count,

$$CD = 100 \ V \quad . \tag{3-22}$$

The circuitry for the wind and current direction and the wind speed sensors are identical, as shown in figure 3-7. Therefore,

$$V_{in} = \frac{R_1 E}{R_1 + R_2} = 4.000 \quad , \tag{3-23}$$

and

$$CD = \frac{ER_1 \ (100)}{R_1 + R_2} = 400 \quad , \tag{3-24}$$

where

E = 8.000 V, and
R_1 and R_2 = 5,700 ohms.

The buoy current speed sensor can be simulated as shown in figure 3-8, where f = 0.311 speed (in cm/s). From the specifications, speeds of 0 to 100 cm/s are equivalent to 000 to 900 raw data units. The relationship of CD and f can be found from eq. (3-2), where

$$m = \frac{\Delta CD}{\Delta Speed} = 9 \quad ,$$

and

$$b = CD - m \ Speed = 0 \quad .$$

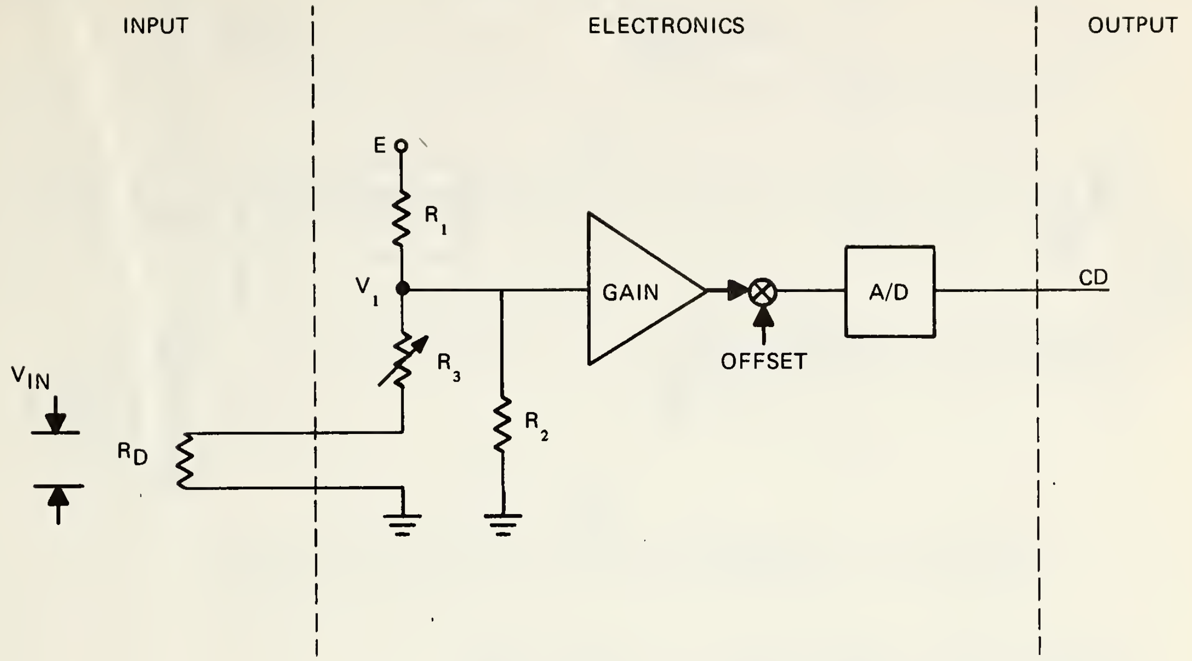


Figure 3-4.--Representation of buoy dewpoint sensor.

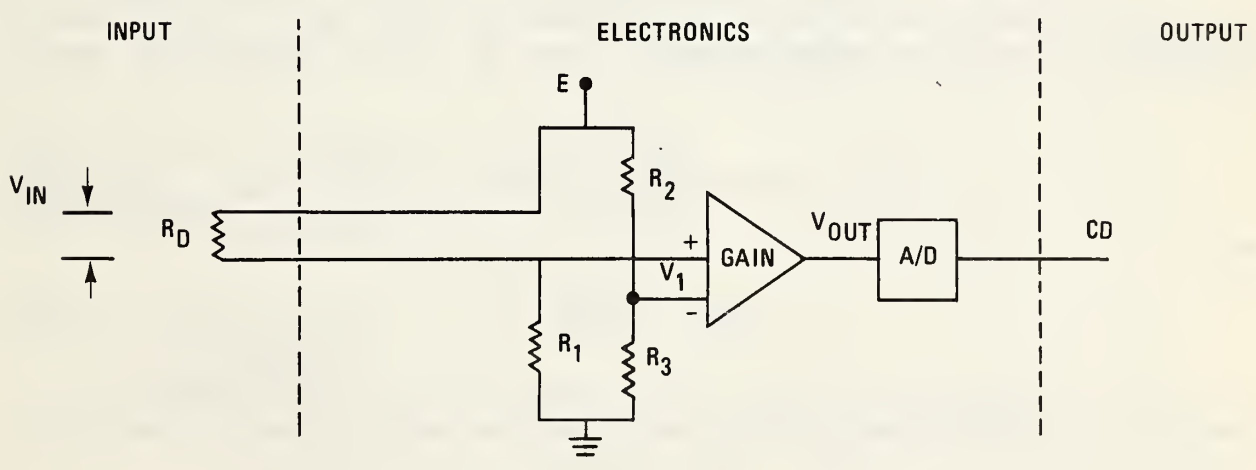


Figure 3-5.--Representation of land station dewpoint sensor.

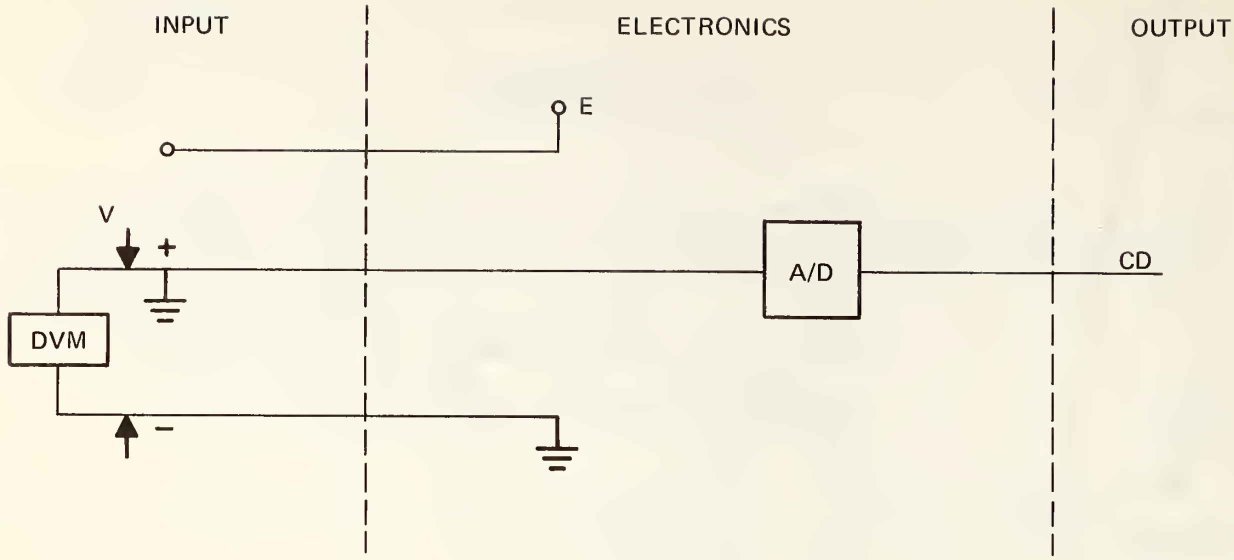


Figure 3-6.--Representation of air pressure channel.

Substituting m and b into eq. (3-2) gives

$$\text{Speed} = \frac{f}{0.311} = \frac{1}{0.311T} \quad , \qquad (3\text{-}25)$$

where T is the time period.

The equations for tower current speed were similar to those used for the buoy current speed, except for the sensor specification that f = 0.122 speed. According to the system specifications, speeds of -100 to 100 cm/s are equivalent to 050 to 950 raw data units. Therefore,

$$CD = \frac{450}{12.2T} + 500 \quad , \qquad (3\text{-}26a)$$

and

$$\text{Speed} = \frac{100}{12.2T} \quad . \qquad (3\text{-}26b)$$

The precipitation channel can be simulated as a switch as shown in figure 3-9. A tip is one switch closure, and the design range is from 0 tips, or 999 raw units, to 63 tips, or 000 raw units. The equation is

$$CD = M\ (\text{Tips}) + b \quad , \qquad (3\text{-}27)$$

where

$$m = \frac{-999}{63} \text{ and } b = 999 \quad .$$

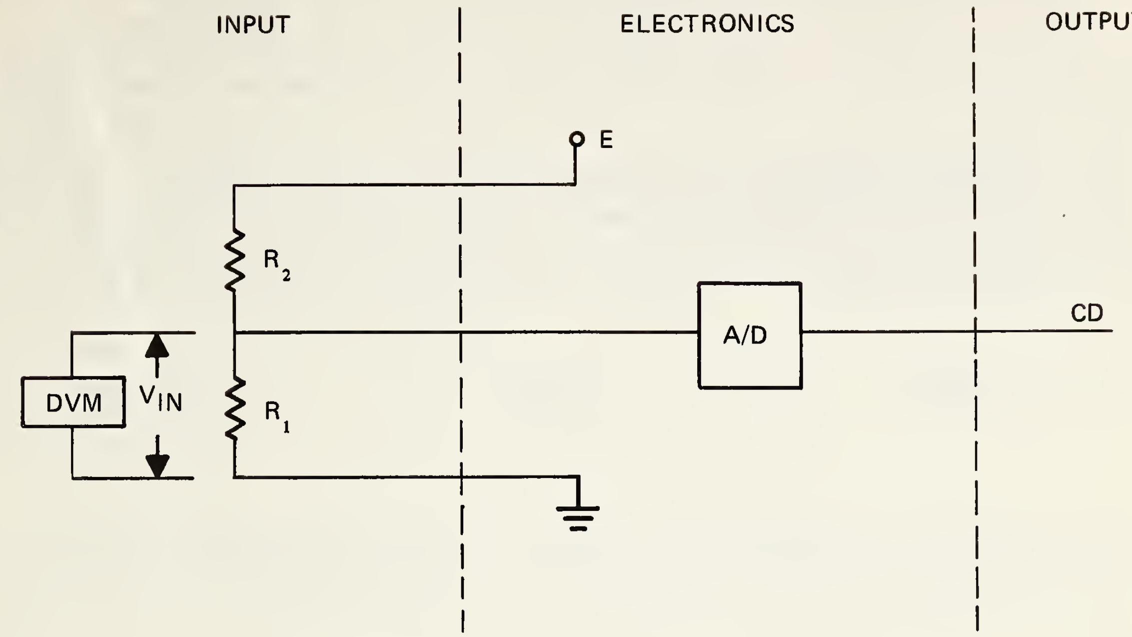


Figure 3-7.--Representation of circuitry for wind and current direction and wind speed sensors.

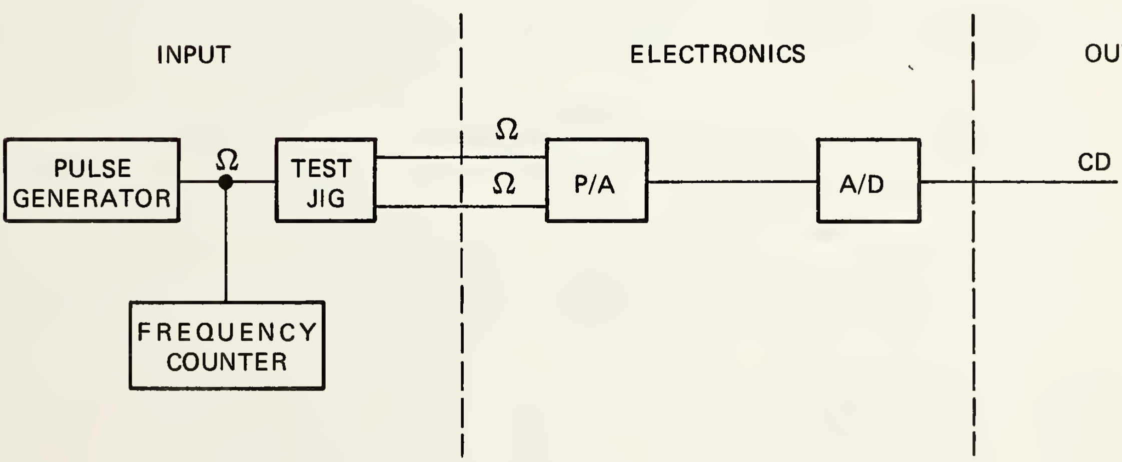


Figure 3-8.--Representation of buoy current speed sensor.

For the shortwave radiometer, which can be simulated as shown in figure 3-10, the nominal response coefficient was assumed to be 7 mV/ly/min. Based on the system specification that 2 ly/min (200 counts) is the maximum and 0 ly/min (000 counts) is the minimum, with a linear response in between, the electronics conform to eq. (3-2), where V is the sensor output in millivolts, m = 100/7, and b = 0.

The longwave radiometer was similar to the shortwave sensor. A nominal response coefficient of 5 mV/ly/min and a system maximum of 4 ly/min (200 counts) and a minimum of 0 ly/min (000 counts), with a linear response in between, were assumed. The electronics conform to eq. (3-2), with m = 10 and b = 0.

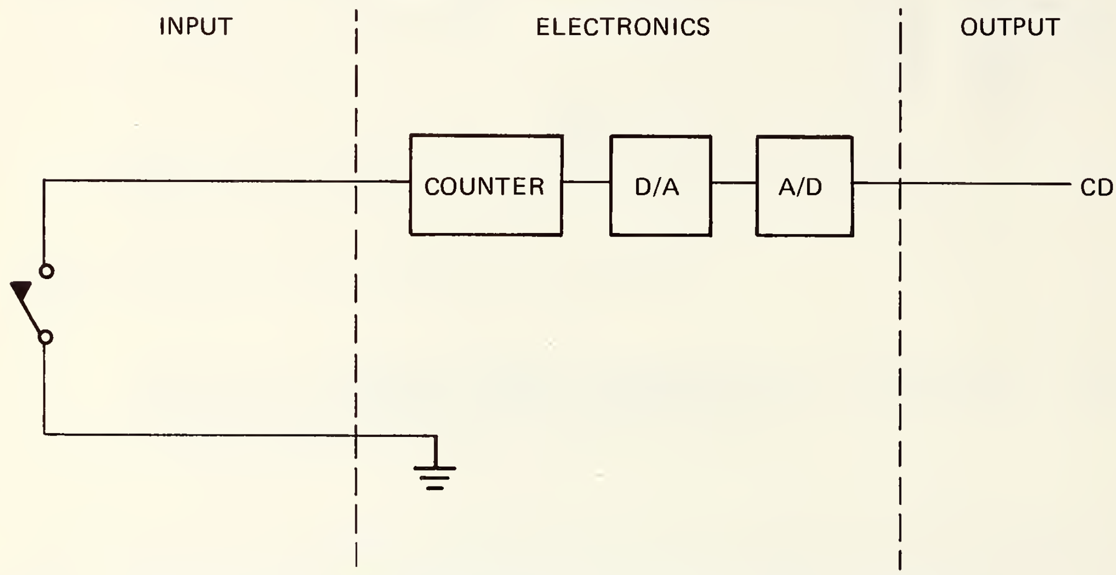


Figure 3-9.--Representation of precipitation channel.

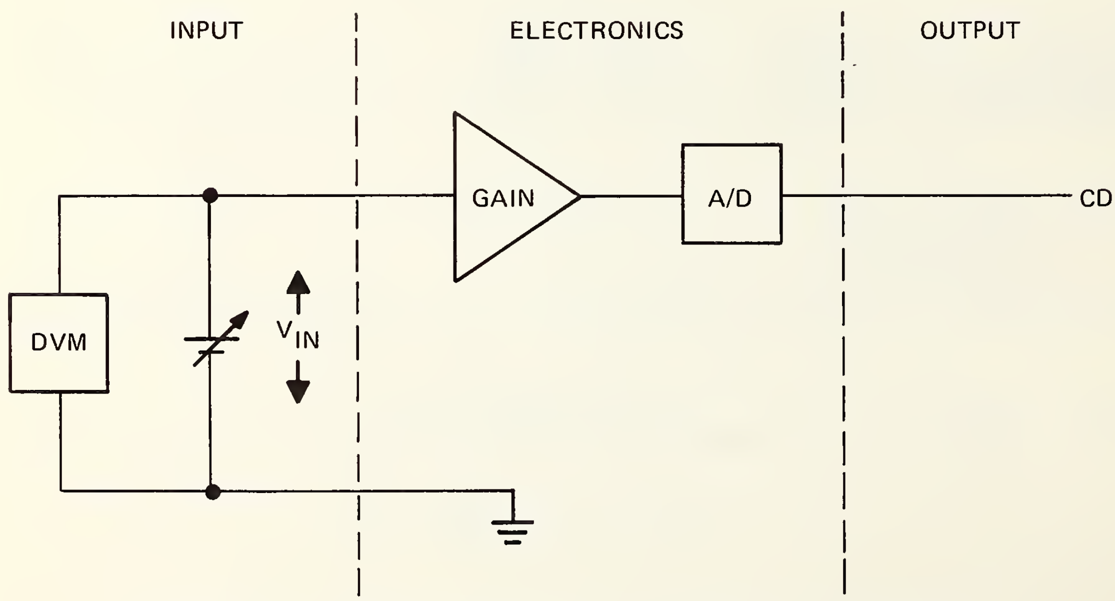


Figure 3-10.--Representation of shortwave radiometer.

4. FACTORS AFFECTING DATA QUALITY AND QUANTITY

4.1 Telephone and Radio Links

Examination of data transmission problems indicated that between 5 and 10 percent of all missing or erroneous data were the result of malfunctions of telephone lines and associated equipment. Data from each subnetwork control station were fed first into a telephone junction and then into the Rochester Control Center (RCC). Faulty connections between RCC and one of the control stations therefore could affect data from other stations. The most common problem was noise on the telephone lines, resulting in data contamination that, in every case, could not be removed in later processing. Failure of the main line between RCC and the subnetworks meant that none of the stations, except the ones in the Rochester network, could be interrogated. When this occurred, however, data recording continued on the backup cassettes, but this type of failure does account for some of the gaps in the data.

Radio problems were restricted almost entirely to the buoys and towers. The radio equipment was the first of the station components to be affected by a decrease in power supply. Difficulties with the buoy thermoelectric generators decreased the power available, with resulting loss in communications.

4.2 Power Supplies

Two commercial power failures occurred at RCC early in the Field Year. When this happened, and backup power was not available, the master control clock did not operate. When commercial power was restored, the clock would start at a random time. This resulted in some data loss, because the computer at the Lake Survey Center (LSC) was programed to reject an observation when any part of the RCC header (day/hour/minute/second) was smaller than in the previous observation. Data storage was resumed at LSC only after the digital clock had been reset. This accounts for some of the gaps in the PDCS data set.

Considerable difficulty was encountered in maintaining the buoys' thermoelectric generator (TEG) output to the battery at the required level. Initially, all units operated satisfactorily and data transmission began immediately after buoy deployment. (Exceptions were buoys 15 and 18, which did not contain radios when deployed.) However, in a short time condensate formed in the TEG intake pipe, and on the walls and in the bottom of the compartment. As the condensate level increased, the burner insulation became wet, reducing the burner temperature and TEG output. Eventually the level reached a point at which one or both of the burners were extinguished. When the battery voltage was sufficient to maintain radio communication, failure could be detected by examining the dewpoint temperature data since loss of a.c. power to the dewcell heater resulted in a sharp drop in dewpoint temperature. However, when the battery voltage decreased slowly because of reduced TEG output, the loss of radio communications indicated TEG failure.

Another effect of the condensate was corrosion of the power transistors. Such damage generally required extensive refurbishment of the electronic burner unit. In many instances a buoy had to be taken off line during the refurbishment period because of insufficient spares, and all data were lost for that period.

On Galloo Island and at the tower stations, data were lost in a few instances when the TEG failed because of inadequate propane supply.

4.3 Sensors

4.3.1 Air Temperature

The thermistor probe was protected from mechanical damage by a radiation shield. The shield required wind speeds of 1.5 mi/h or more for proper operation, and several units were found to lack freedom of rotation at low wind speeds because of bearing wear. Clogging of the shield with snow and ice during winter operations may have degraded some of the data.

4.3.2 Dewpoint

The dewcell was protected by a guard and enclosed within a weatherhood. The lithium chloride solution applied to the element was expected to last 6 months, but such factors as moisture and contaminants had to be considered in scheduling the cleaning cycle. Another factor was the time needed for the dewcell to reach equilibrium when power was applied. Under ambient conditions, the time varied between 1 and 2 hr, but when power was lost an additional warm-up period was required. Most of the data recorded during these periods are included in the provisional data base, with the provisional time-series graphics highlighting the problem. These data are not a part of the final, edited data set.

4.3.3 Air Pressure

Primary among the inherent aneroid barometer problems were variations in the calibration curve caused by temperature changes and sensitivity to motion. During the Field Year, data from the air pressure sensor showed extreme transitions or discontinuities for periods of several days. A test to isolate malfunction was performed on buoy 20 by replacing the air pressure sensor with a fixed voltage divider. Results showed that the problem was associated with the sensor itself. The exact cause could not be determined, but indications pointed to a combination of temperature, moisture, platform motion, and filter configuration.

4.3.4 Wind Speed

As could be expected, the major problem with the standard three-cup anemometer, which generated a d.c. voltage proportional to rotation, lay in the bearings. The combination of bearing wear and environmental effects on the bearing assembly were responsible for changes in the sensor threshold. No data were available concerning the overall effects of buoy motion. During the winter months icing of the cups occurred, causing stoppages for periods of up to several days.

4.3.5 Wind Direction

On the buoys, the wind direction sensor housed a compass to orient measurements with respect to true north. The inherent problems of a magnetic compass on a moving platform, with local sources of magnetic interference,

were not evaluated. Predeployment checks showed the sensor's range varied from 356° to 358°.

The main problem was that the fin portion of the vane occasionally broke loose from the shaft and either rotated freely about the shaft or broke off completely. Such occurrences were not readily detectable because of buoy motion. Also, if the fin remained on the shaft, the vane would still attempt to align itself with the wind. These malfunctions were usually corrected during routine maintenance.

At the land, island, and tower stations, the wind direction sensor did not contain an internal compass and had to be aligned with respect to a known heading, as shown in table 4-1 and figure 4-1. This requirement introduced an error of less than 5° in the data.

The problem with the vane was the same as on the buoys.

Table 4-1.--Heading used to align wind direction sensors on land and island stations

Station No.	Station type	Support arm angle with respect to magnetic north (°)
22	Land	65
25	"	89
28	"	5
29	"	98
30	Island	285
31	Land	227

4.3.6 Radiation

The primary problem with the longwave radiation sensors, particularly those measuring incident radiation, was the formation of deposits on the sensing enevelope. When a heavy deposit had formed, the only solution was to remove the sensor. Lack of spares prevented rotation of sensors and, although sensitivity checks were made periodically to detect degradation, resulted in some stations being without sensors for extended periods, leaving gaps in the data.

Initially, the coating on some of the shortwave radiation sensors flaked off, but this was corrected. The basic problem, here too, was the presence of foreign substances on the sensor envelopes, but it was not as serious as with the longwave radiometers, because the envelopes did not discolor and the deposits could be removed with a soft cloth. In two instances loose seals permitted condensation to form inside the envelope. Lack of sufficient spares prohibited rotation of the sensors as often as would have been desirable. As a check on performance, tests were made

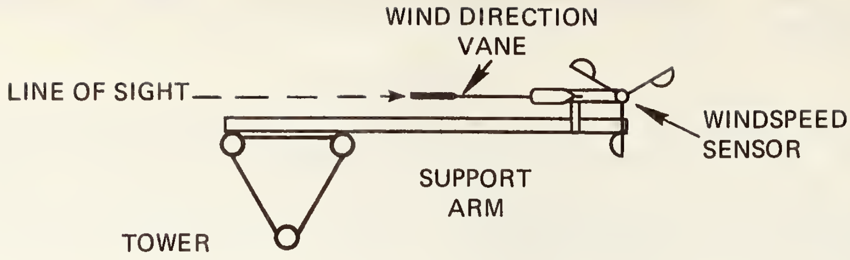


Figure 4-1.--Representation of wind direction sensor.

during routine maintenance by turning the sensor measuring reflected radiation upright and comparing its output with the output of the radiometer measuring incident radiation.

4.3.7 Water Temperature

This probe contained two thermistors and a resistor in an epoxy-filled, stainless steel probe, which was hard-wired to the underwater signal cable to avoid connector problems. The method of splicing used proved very satisfactory, with only isolated instances of leakage. No mechanical damage to the probe was encountered.

4.3.8 Precipitation

A tipping bucket was used to activate switches, which, when closed, provided a measurement of precipitation. The land and island installations included heaters and wind shields. Accumulation of foreign material in the funnel and funnel screen, the gage not remaining level, and platform motion were some of the problems anticipated. However, only slight fouling of the tunnel and minor problems in gage levelness actually occurred. Sensor malfunctions were limited to failure of the heating elements.

4.3.9 Pan Evaporation

The basic problem with this equipment was keeping the water-filled tank free of foreign substances. The pan was placed in a fenced area, and bleach was added to the water to reduce biological growth. The full-scale range of raw data equivalent to 10 cm of evaporation was determined by adding various amounts of water to the still-well with a 1,000-ml graduated cylinder and obtaining raw data readings. While care was taken in this operation, the data should be used with caution.

4.3.10 Current Speed and Direction

On the towers, the data from this sensor were referenced to a known heading that was fixed by the orientation of the tower. Information on current direction was therefore dependent on accurate knowledge of the tower position.

Because of the open configuration of the meter, foreign objects became entangled around the impeller shaft. In addition, considerable biological growth was found on the impellers, particularly during the summer months. The shallow current meters were cleaned during routine maintenance trips. The meters at greater depths, which were subject to less fouling, were cleaned by divers on an "as-available" basis. Divers also measured the depths of the meters after deployment. (See appendix III.) Some performance degradation resulted from bearing wear.

On the buoys, a magnetic compass served as the reference base for the current meter. The problems inherent here, as in the wind direction sensors, with a magnetic compass located on a moving platform, and local sources of magnetic interference, were not evaluated. A 4-ft vane positioned the bidirectional ducted impeller and the wiper of the potentiometer in the direction of dominant flow. The impeller was designed to respond equally to forward and reverse current, eliminating the effects of turbulence.

The primary difficulty on the buoys was the vane assembly. Inspection of the meters by divers often revealed that the vane was missing completely, or that the boom and/or the fin was broken. The probable cause of the breakage was the vane striking the support bracket. Tests showed that when the meter swung approximately 35° the top of the fin could strike the bracket. Indentations in the top of the housing of some meters indicated that the meters were swinging through more than 90°. No empirical relationship could be established between sea state and degrees of arc, but observation of a 5-m sensor during 5- to 6-ft waves and 30- to 35-kt winds showed deviations of 10° or less. This indicates that damage occured only under the most severe weather conditions.

It was also observed that breakage could occur if any part of the vane was loose, placing the fin in a horizontal position. The fin was 1 m^2 in area, and the force at the vane attachment point due to vertical acceleration was significant. Several vanes were broken at this junction, and were replaced to the extent possible. In some cases, in an attempt to eliminate breakage, the 4-ft boom was removed and the fin was secured directly to the boom attachment point. This modification was only partly successful, and its effect on sensor response is not known.

Several current meters were lost during the Field Year, probably because of unexpected motion. Through this motion the suspension shackles would become locked together, and the lack of freedom of movement would increase the friction between the shackles, causing them to break.

4.4 Other Factors

The chronology of events, as outlined in appendix I, shows a general delay in the execution of specific tasks. Because the original schedule was not adhered to as closely as would have been desirable, a great deal of data was lost. The major order for spare parts was not filled until late in the Field Year, and parts for the buoys were in some cases not delivered

until after retrieval, at the end of the data collection operations. Lack of spare parts kept some stations from being operational, and parts were taken from low-priority stations to enable high-priority stations to function. For varying periods of time, several buoys were left without current meters, longwave radiometers and radios were removed from several stations, and thermoelectric generators were taken out and not replaced.

Calibration of sensors, through rotation, without loss of data was also a problem. The original plan of removing buoy sensors several times during the Field Year had to be abandoned because the establishment of the calibration facility at Rochester was delayed and because spare sensors were lacking. As a result, both data quality and quantity were affected in many cases.

Rough weather kept maintenance crews from working on the buoys and towers for weeks at a time. Under moderate conditions, a tower could be boarded and maintenance performed, but this was not true of the buoys under the same conditions. Calm weather was required for work to be done on the buoy electronics or the thermoelectric generator, because a hatch had to be opened. To change the sensors on a buoy the mast had to be climbed, and this, too, could only be done under calm conditions. As a result, maintenance in some cases amounted only to replenishment of the propane supply.

The geographic locations also determined the frequency with which stations could be visited and inspected. Vehicle, headquarters, marina, and other equipment support during the Field Year were generally adequate, however.

5. DATA PROCESSING

The scheme used in processing the PDCS data is illustrated in figure 5-1. During the Field Year, messages were recorded on the RCC weekly tapes in burst mode, at variable densities, and all of them could therefore not be decoded automatically. The rest had to be printed out, or dumped, and decoded manually, an effort that required 2 man-years by a team of physical scientists and technicians at the Center for Experiment Design and Data Analysis (CEDDA). Only 65 to 95 percent of the PDCS data that could be processed were recovered automatically; after the manual decoding, the percentage rose to between 80 and 100 percent.

All PDCS calibration data were recorded manually during the field operations and had to be collated, abstracted, and preprocessed before use, a manual task that also absorbed considerable manpower.

Processing of the PDCS data was divided into three stages. In the first stage, corrections were made for sensor electronics. Data from the performance checks, both before and after deployment of the sensors, were used to correct the internal calibrations. The assumption was made that the automatic internal calibration values fell on a straight line fit of the performance check data and represented a base for calculating drifts during the field operations. The internal calibration values used are listed in appendix IV.

In the second stage of processing, the raw data counts were converted into scientific units. Nominal transfer functions were used, derived from the system equations provided by the manufacturer; from the electronics equations furnished by the primary contractor, Texas Instruments, Inc; and from the calibration checks. The equations used are given in section 5.1 below.

In the third stage, corrections were made for particular sensors and their orientation on the measurement stations. Sensor calibration corrections were applied when the manufacturer's information was considered unreliable, or when, in the case of air and water temperature, a calibration procedure with an error of less than 1/4 of the sensor error had been used. The calibration correction values, applied through linear interpolation, are listed in appendix V. Some sensors also required station position corrections. These are shown in appendix VI.

5.1 Conversion to Scientific Units

The internal electronics calibrations (app. IV), the sensor calibration corrections (app. V), and the station position corrections (app. VI) were applied differently for each parameter. Since the internal electronics calibration was a straight line fit, these calibrations were applied as a slope (α) and intercept (β), respectively, as indicated by the second of each set of equations given in the sections that follow. The transfer coefficients S_1 and S_0 are listed in appendix V.

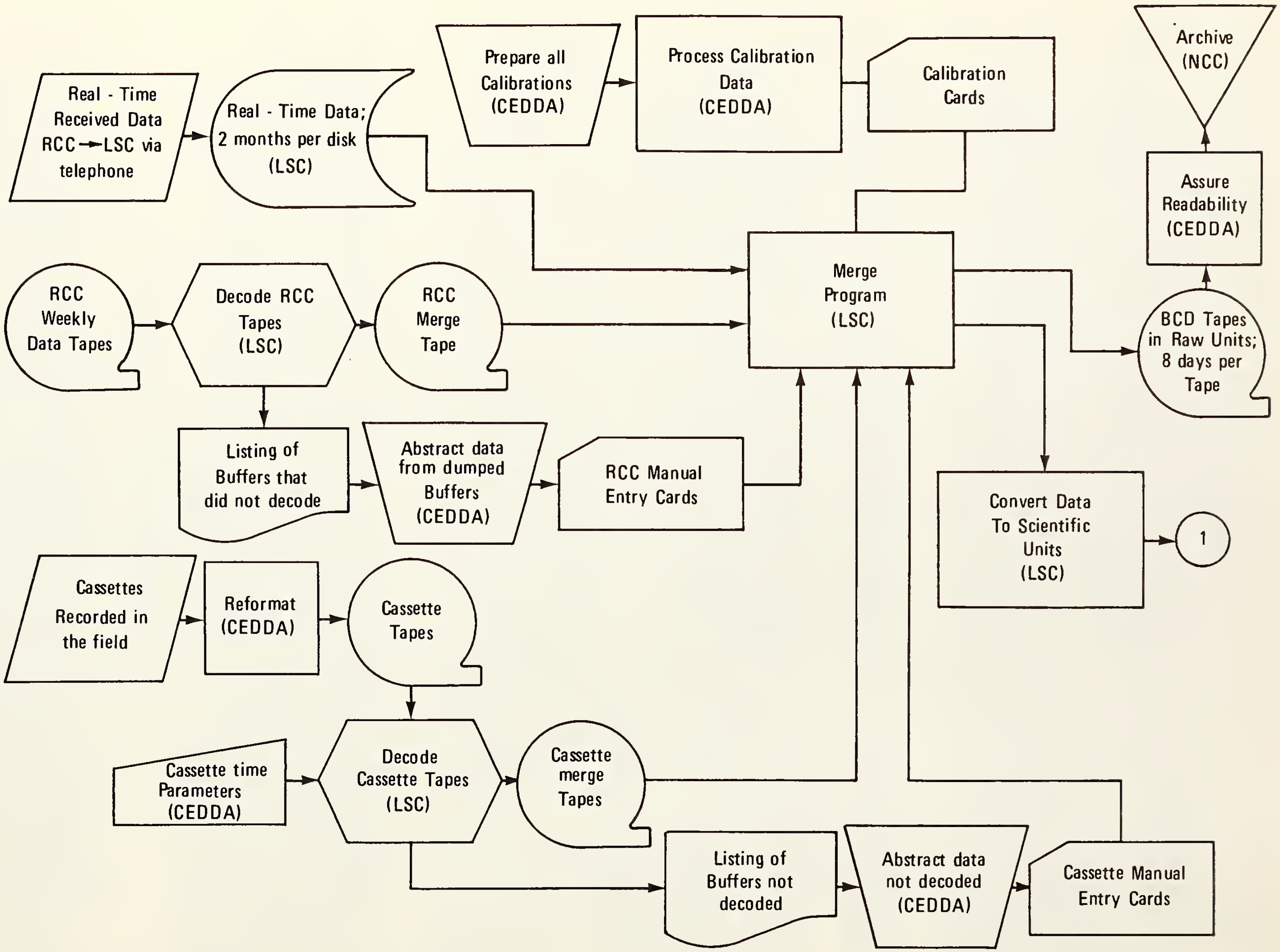


Figure 5-1.--Data reduction flow chart.

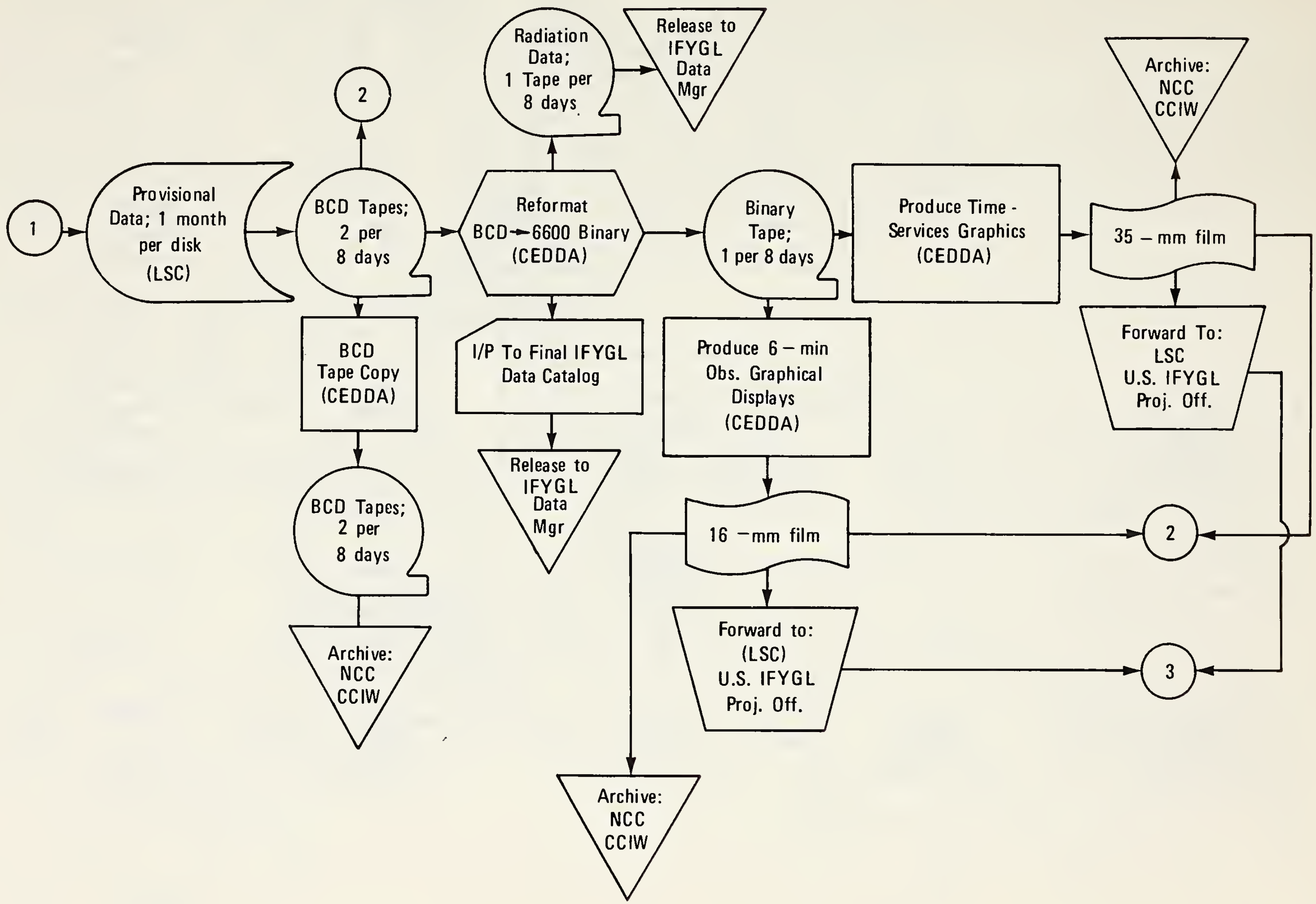


Figure 5-1.--Data reduction flow chart (Continued).

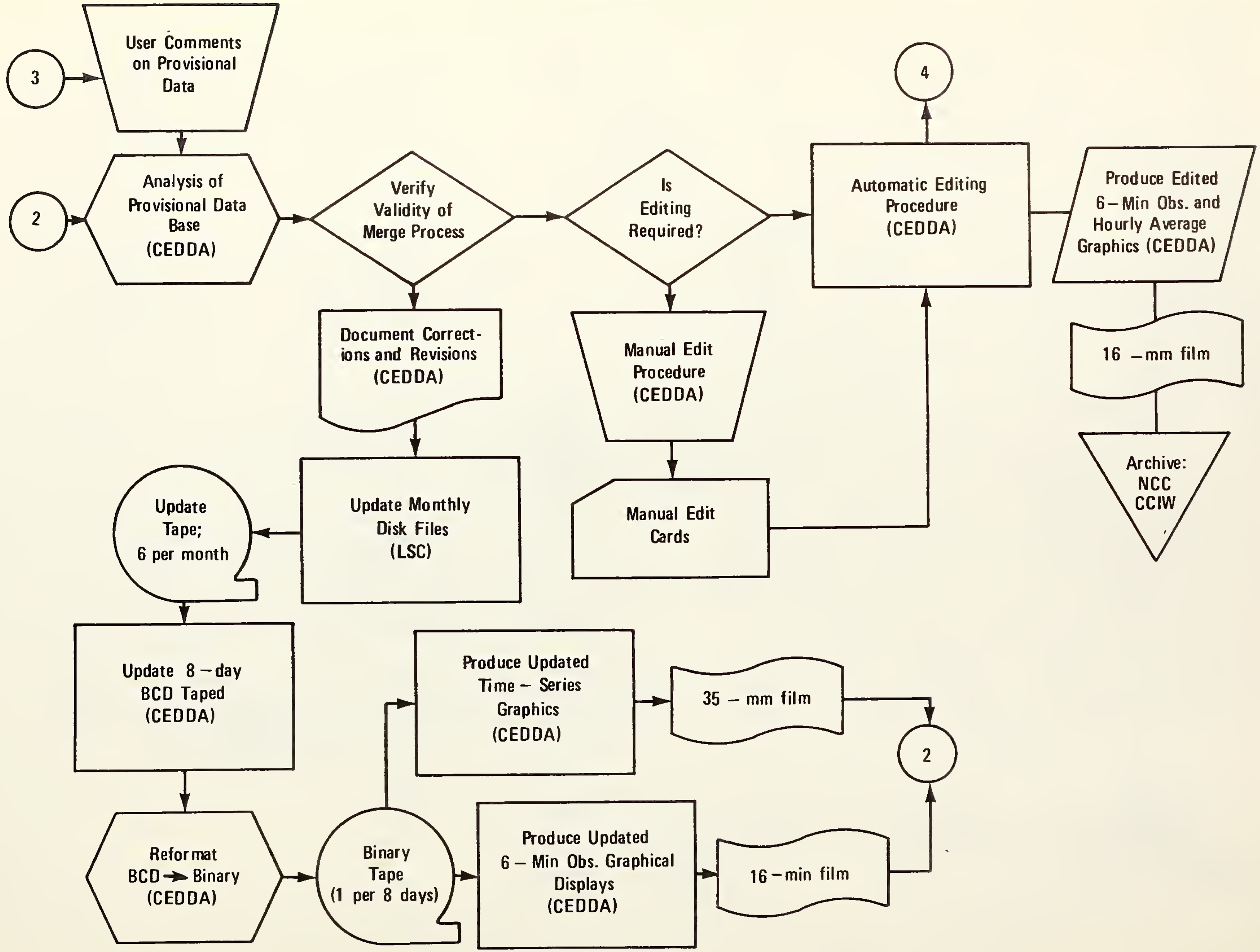


Figure 5-1.--Data reduction flow chart (Continued).

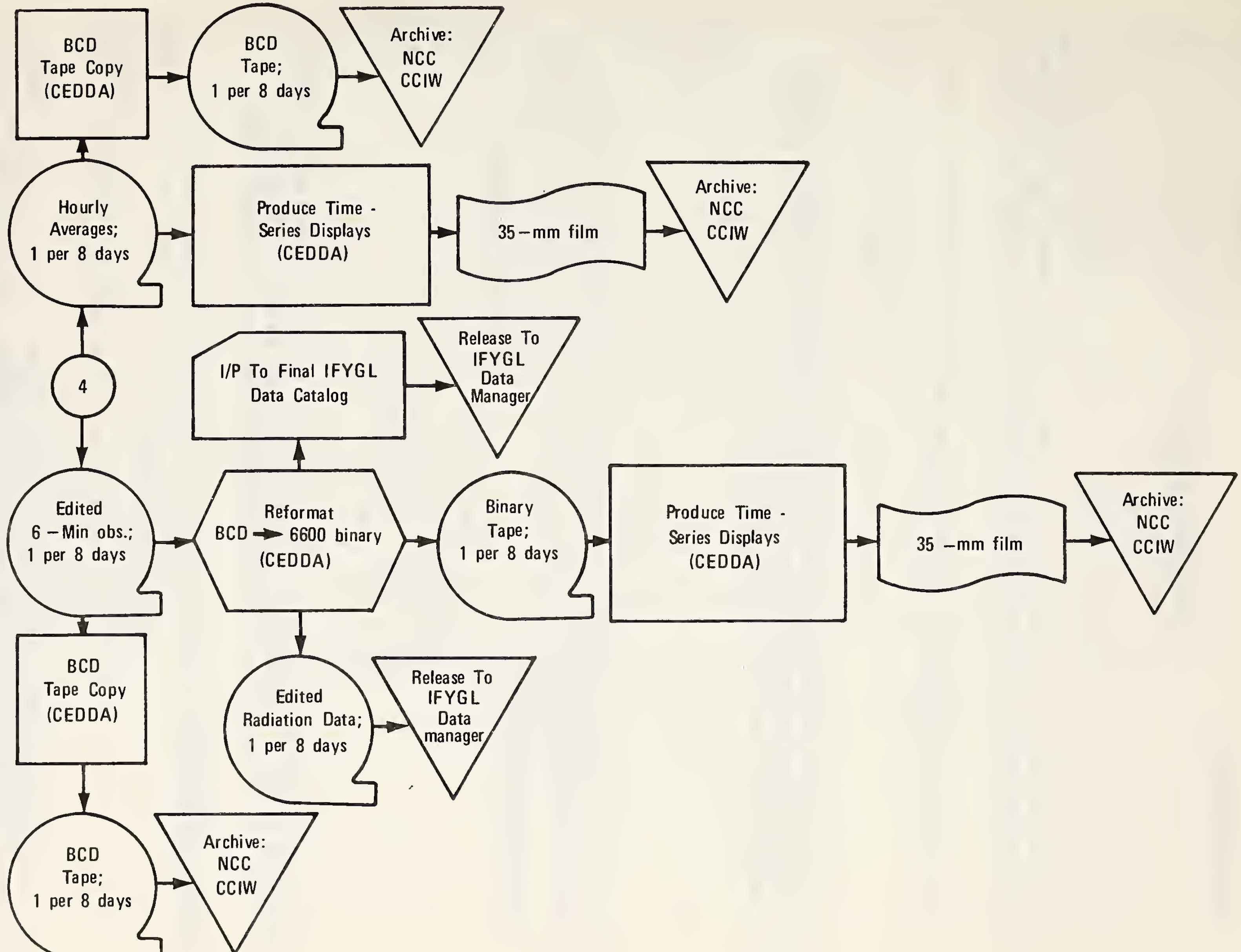


Figure 5-1.--Data reduction flow chart (Continued).

5.1.1 Air Temperature

$$
\begin{aligned}
R &= \text{raw data counts}, && (1)\\
R' &= \alpha R + \beta, && (2)\\
E_0 &= S_1 R' - S_0, && (3)\\
E_1 &= E_0 + f(E_0), && (4)
\end{aligned}
$$

where E_1 is the corrected temperature in degrees Celsius, and $f(E_0)$ represents the linear interpolation between the sensor correction values given in appendix V.

The error in temperature, Δ_T, is defined as

$$\Delta_T = T_c - T_t , \tag{5}$$

where T_t is the true temperature, and T_c is the calculated temperature from eq. (3). The sensor correction table was then converted to a table of calculated temperatures and corrections, where

$$T_c = T_t + \Delta, \tag{6}$$

$$\Delta' = -\Delta, \tag{7}$$

Δ' being the correction applied to the calculated temperature in order to obtain the true temperature.

5.1.2 Atmospheric Pressure

$$
\begin{aligned}
R &= \text{raw data counts}, && (1)\\
R' &= \alpha R + \beta, && (2)\\
E_0 &= S_1 R' - S_0, && (3)\\
E_1 &= (E_0 - 950) + f(E_0), && (4)\\
E_F &= E_1 + 950, && (5)
\end{aligned}
$$

where E_F is the corrected pressure in millibars, and $f(E_0)$ represents the interpolation between the sensor calibration values given in appendix V. In eq. (4), 950 mb is subtracted from the pressure for ease in computation.

5.1.3 Pan Evaporation

$$
\begin{aligned}
R &= \text{raw data counts}, && (1)\\
R' &= \alpha R + \beta, && (2)\\
E_1 &= (0.0145138)\ R' + (-0.3628), && (3)
\end{aligned}
$$

where E_1 is the final pan evaporation in centimeters. The only sensor calibration was a measurement of the high and low voltage outputs while the sensor was on site. The only assumption possible, therefore, was that the sensor responded linearly between these values, yielding the coefficients in eq. (3).

5.1.4 Precipitation

$$R = \text{raw data counts}, \quad (1)$$
$$R' = \alpha R + \beta, \quad (2)$$
$$E_0 = S_1 R' - S_0, \quad (3)$$

where $S_1 = -0.0630$, $S_0 = -63.00$, and E_0 is rounded to the nearest integer, which gives

$$E_1 = (0.025)\ E_0\ , \quad (4)$$

where E_1 is the precipitation in centimeters per 6 min.

5.1.5 Longwave Radiation

$$R = \text{raw data counts}, \quad (1)$$
$$R' = \alpha R + \beta, \quad (2)$$
$$E_0 = S_1 R', \quad (3)$$
$$E_1 = C_1 E_0, \quad (4)$$

where

$$C_1 - 5.0/(ACC)$$

E_1 is the corrected value for longwave radiation in langleys per minute, and ACC is the actual cell constant as given in appendix V.

5.1.6 Shortwave Radiation

$$R = \text{raw data counts}, \quad (1)$$
$$R' = \alpha R + \beta, \quad (2)$$
$$E_0 = S_1 R', \quad (3)$$
$$E_1 = C_1 E_0, \quad (4)$$

where

$$C_1 = 7.0/(ACC),$$

E_1 is the final shortwave radiation value in langleys per minute, and ACC is the actual cell constant given in appendix V.

5.1.7 Dewpoint

$$R = \text{raw data counts}, \quad (1)$$
$$R' = \alpha R + \beta, \quad (2)$$
$$R'_c = R' + (R' - 11038.42)^2 PC/5294926, \quad (3)$$
$$E_0 = (0.09627)\ R'_c - 2.27, \quad (4)$$
$$E_1 = f(E_0), \quad (5)$$

where, in eq. (3), PC is the station position correction obtained from appendix VI. Because of the nature of the sensor, the data have to be converted to dewpoint in two steps by eqs. (4) and (5). In the latter equation, to obtain the corrected dewpoint E_1, linear interpolation is used between the following values:

E_0 (Dewcell)	E_1 (Dewpoint)
-8.00	-28.90
34.00	-0.90
47.00	9.00
71.00	25.40
77.00	29.30
90.00	37.00
96.00	41.40

5.1.8 Wind Direction (Buoys)

$$R = \text{raw data counts}, \tag{1}$$
$$R' = \alpha R + \beta, \tag{2}$$
$$E = S_1 R', \tag{3}$$
$$E_1 = E + PC, \tag{4}$$

where $S_1 = 0.4438$ for all sensors, E_1 is the corrected wind direction in degrees of arc from true north, and PC is the station position correction as given in the following table:

IFYGL station No.	Correction (° of arc)
12	-8.8
13	-8.8
14	-9.7
15	-9.7
16	-10.1
17	-10.1
18	-10.8
19	-11.2
20	-11.2
21	-11.5

5.1.9 Wind Direction (Land, Island, and Tower Stations)

$$R = \text{raw data counts}, \tag{1}$$
$$R' = \alpha R + \beta, \tag{2}$$
$$E = S_1 R - S_0, \tag{3}$$
$$E_1 = E + PC, \tag{4}$$

where PC is the station position correction as given in appendix VI, and E_1 is the corrected wind direction in degrees of arc from true north.

5.1.10 Wind Speed

$$R = \text{raw data counts}, \tag{1}$$
$$R' = \alpha R + \beta, \tag{2}$$
$$E_0 = S_1 R' - S_0, \tag{3}$$

where E_0 is the final wind speed in meters per second.

5.1.11 Water Temperature

$$R = \text{raw data counts}, \tag{1}$$
$$R' = \alpha R + \beta, \tag{2}$$
$$E_0 = S_1 R' - S_0, \tag{3}$$
$$E_1 = E_0 + f(E_0), \tag{4}$$

where E_1 is the corrected water temperature in degrees Celsius, and $f(E_0)$ is the result of interpolating between the values in the sensor calibration correction table given in appendix V. The table consists of eight values of true temperatures (-5°C to 30°C, in 5°C increments) and the corresponding thermistor errors. These errors are defined as

$$\Delta = T_c - T_t, \tag{5}$$

where T_t = true temperature, and T_c = calculated temperature.

The values in the sensor correction table are converted to a table of calculated temperatures and corrections as follows:

$$T_c = T_t + \Delta, \tag{6}$$

$$\Delta' = -\Delta, \tag{7}$$

where Δ' is the correction applied to the calculated temperature in order to obtain the true temperature.

5.1.12 Water Temperature (Evaporation Pan)

The data conversion process for the evaporation pan water temperature is the same as described in section 5.1.10 above, with the exception that the evaporation pan temperatures range from -5°C to 40°C, in 5°C increments, as shown in appendix V.

5.1.13 Current Direction (Buoys)

$$R = \text{raw data counts}, \tag{1}$$
$$R' = \alpha R + \beta, \tag{2}$$
$$E = S_1 R', \tag{3}$$
$$E_1 = E + PC, \tag{4}$$

where $S_1 = 0.4500$ for all sensors, PC is the station position correction as given in section 5.1.8 for buoy wind direction, and E_1 is the corrected current direction in degrees of arc toward true north.

5.1.14 Current Speed (Buoys)

$$R = \text{raw data counts}, \tag{1}$$
$$R' = \alpha R + \beta, \tag{2}$$
$$E = S_1 R', \tag{3}$$

where $S_1 = 0.1111$, and E is the corrected current speed in centimeters per second.

5.1.15 Current Speed and Direction (Towers)

The conversion for this sensor is somewhat different from the previous derivations. The raw data counts are used in pairs for the following sensor position numbers:

Shallow-Water Tower	Deepwater Tower
01, 02	01, 02
03, 05	03, 05
	06, 07
	09, 10
	11, 13

Current direction is then computed from two orthogonal speeds,

$$R_1, R_2 = \text{raw data counts}, \tag{1}$$

$$R_1' = \alpha_1 R_1 + \beta_1, \tag{2}$$

$$R_2' = \alpha_2 R_2 + \beta_2, \tag{3}$$

where the values for α_1, α_2, β_1, β_2, paired in the same way as the raw data counts, are given in appendix IV. Then,

$$E_1 = S_1 R_1' - S_0, \tag{4}$$

$$E_2 = S_1 R_2' - S_0, \tag{5}$$

where $S_0 = 111.11$, and $S_1 = 0.2222$. The uncorrected direction in radians, A_0, is obtained from

$$A_0 = \tan^{-1} (E_2/E_1), \tag{6}$$

and the uncorrected current speed, M_0, from

$$M_0 = (E_1^2 + E_2^2)^{\frac{1}{2}}, \tag{7}$$

which yields

$$M_c = M_0(1.0 + \sum_{i=0}^{6} a_i \cos(4_i A_0)) \tag{8}$$

for the corrected speed, M_c, where

$$\begin{aligned} a_o &= 0.0946, \\ a_1 &= -0.0899, \\ a_2 &= -0.0054, \\ a_3 &= 0.0019, \\ a_4 &= 0.0015, \\ a_5 &= -0.0001, \text{ and} \\ a_6 &= -0.0008. \end{aligned}$$

The corrected angle between, A_c, between 0° and 360° is obtained from

$$A_c = A_0(180.0/\pi) + \sum_{j=0}^{4} \cos(4_j A_0) \quad , \tag{9}$$

where

$$\begin{aligned} b_0 &= 1.99, \\ b_1 &= 0.10, \\ b_2 &= -1.46, \\ b_3 &= -0.13, \text{ and} \\ b_4 &= -0.26. \end{aligned}$$

The corrected direction θ, is obtained from

$$\theta = 45.0 + A_c + PC, \tag{10}$$

where PC is the station position correction given in appendix VI.

The final current speed, M_c, is in centimeters per second, and the final current direction, θ, is in degrees of arc toward true north.

5.2 PDCS Provisional Data Set

Following the conversion to scientific units, a provisional data set was generated. In this set, the real-time instantaneous 6-min observations are merged with the data from the 66 usable cassette recordings and from the RCC weekly data tapes, with electronics and sensor calibrations applied. These provisional, unedited, data consist of 88 seven-track BCD tapes and of time-series graphics, as shown in figure 5-2, each covering 8-day periods for each month (days 1-8, 9-16, 17-24, and 25-month's end). Additional microfilm, sequenced by station and sensor, containing 2 days of 6-min observations per frame was also generated, as shown in figure 5-3. Any missing data are represented by -999.

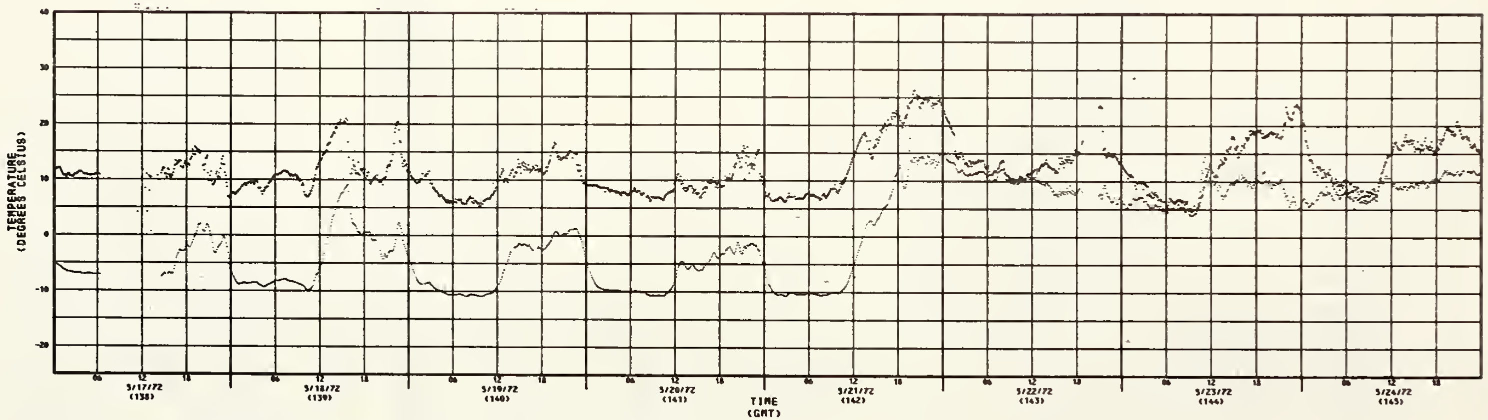
FRAME 1
PROVISIONAL DATA - DATA WILL BE TREATED FURTHER.

COMPUTER GENERATED ON MARCH 22, 1974

NOAA/IFYGL

EIGHT DAYS OF MEASUREMENTS OBTAINED AT 6 MINUTE INTERVALS - MAY 17, 1972 THRU MAY 24, 1972 - TIME GIVEN IN GMT.
PDCS STATION NUMBER 2 (INTERNATIONAL STATION LOCATION NUMBER 22, LATITUDE 43°16'21" N, LONGITUDE 79° 0'21" W), LAND PLATFORM.

PDCS SENSOR POSITION 1, AIR TEMPERATURE AT 1.5 METERS ABOVE LAND. LINE INTENSITY ———
PDCS SENSOR POSITION 6, DEW POINT TEMPERATURE AT 1.5 METERS ABOVE LAND. LINE INTENSITY ———



PDCS SENSOR POSITION 5, BAROMETRIC PRESSURE AT 1.5 METERS ABOVE LAND. LINE INTENSITY ———

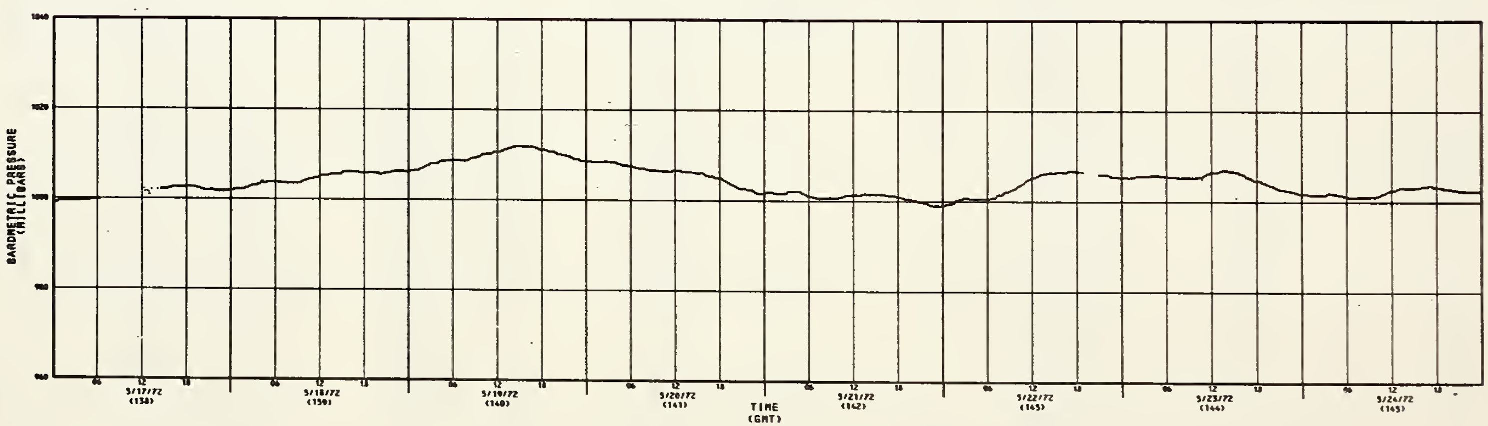


Figure 5-2.--Sample time-series graphics for each of four 8-day periods.

INTERNATIONAL FIELD YEAR FOR THE GREAT LAKES - PHYSICAL DATA COLLECTION SYSTEM GENERATION DATE 04/10/74 12.06.06.
IFYGL STATION 22 PLATFORM LAND STATION (NIAGARA) PARAMETER AIR TEMPERATURE FRAME NO 3
LATITUDE 43 16 21 LONGITUDE 79 00 21 HEIGHT/DEPTH 1.5 M. UNITS DEG C

	MINUTE / HOUR	00	06	12	18	24	30	36	42	48	54
13 OCT 1972 287	0	9.18	9.18	8.92	8.78	8.45	8.52	8.45	8.32	-99.99	-99.99
	1	8.32	8.52	8.45	8.45	8.52	8.45	8.38	8.32	8.25	8.12
	2	8.12	8.05	7.99	7.85	7.91	7.78	7.71	7.78	7.71	7.71
	3	7.65	7.78	7.78	7.71	7.65	7.58	7.52	7.58	7.45	7.38
	4	7.52	7.45	7.38	7.32	7.25	7.25	7.32	7.32	7.25	7.19
	5	7.19	7.19	7.19	7.05	7.05	7.05	6.78	6.85	6.91	-99.99
	6	-99.99	6.65	6.38	6.52	6.38	-99.99	6.25	6.38	-99.99	-99.99
	7	6.05	5.91	5.85	5.98	5.85	5.72	5.85	5.78	5.91	5.78
	8	5.72	5.78	5.65	5.65	-99.99	5.52	5.38	5.25	5.19	5.25
	9	5.58	5.52	5.52	5.52	5.45	5.45	5.45	5.52	5.38	5.38
	10	5.32	5.45	5.32	5.19	5.19	5.32	5.25	5.12	-99.99	-99.99
	11	4.98	4.72	4.85	5.05	5.05	4.98	4.98	4.92	4.98	5.05
	12	4.98	5.12	5.12	5.19	4.59	4.59	4.52	4.52	4.52	4.52
	13	4.52	4.52	-99.99	4.59	4.66	4.72	4.79	4.79	4.98	4.92
	14	5.12	5.19	5.12	5.32	5.32	5.32	5.38	5.32	5.38	5.32
	15	5.52	5.45	5.32	5.58	5.65	5.65	5.58	5.65	5.72	5.52
	16	5.65	-99.99	-99.99	-99.99	5.98	6.58	6.32	6.32	6.38	6.85
	17	6.52	6.45	6.85	6.85	7.45	7.19	7.71	8.05	8.52	8.92
	18	7.91	8.71	8.71	8.38	8.05	8.38	8.58	7.71	7.99	8.25
	19	8.45	8.52	8.71	-99.99	-99.99	-99.99	-99.99	-99.99	-99.99	-99.99
	20	-99.99	-99.99	8.38	8.18	8.05	8.78	-99.99	-99.99	8.65	8.52
	21	8.92	8.25	8.32	8.38	8.45	8.38	8.38	7.85	7.05	6.72
	22	6.78	7.99	7.19	6.85	7.12	6.72	6.05	6.58	6.72	6.52
	23	6.52	6.19	5.98	6.05	6.52	6.78	7.05	7.19	7.25	7.38
14 OCT 1972 288	HOUR										
	0	7.32	7.32	7.38	7.32	7.38	7.58	7.58	7.71	7.78	7.85
	1	7.99	7.99	8.05	8.12	7.91	7.91	7.85	7.78	7.85	7.85
	2	7.85	7.91	8.05	7.99	7.99	8.05	7.91	8.05	7.99	7.91
	3	7.91	7.99	7.85	7.91	8.05	8.18	8.18	8.52	8.71	8.85
	4	8.92	9.18	9.25	9.25	9.32	9.32	9.32	9.32	9.32	9.45
	5	9.52	9.79	9.85	9.99	9.99	10.18	10.25	10.38	10.51	10.51
	6	10.64	10.64	10.64	10.51	10.58	10.85	-99.99	-99.99	11.24	11.37
	7	11.44	11.57	11.51	11.57	11.71	11.71	11.71	11.77	11.71	11.64
	8	11.51	11.57	11.51	11.44	11.51	11.44	11.51	11.57	11.57	11.64
	9	11.64	11.71	11.64	11.71	11.51	11.51	11.64	11.71	11.77	11.77
	10	11.84	11.91	11.97	11.97	12.04	12.04	12.04	12.10	12.17	12.10
	11	12.24	12.24	12.10	12.24	12.30	12.30	12.50	12.50	12.50	12.57
	12	12.64	12.64	12.50	12.64	12.64	12.64	12.64	12.70	12.64	9.79
	13	12.70	12.83	12.97	13.03	12.90	13.03	13.03	13.10	13.16	13.16
	14	13.10	13.10	12.90	12.90	12.90	13.10	13.10	13.10	13.03	13.03
	15	13.10	13.23	12.83	12.70	12.70	12.77	12.77	12.83	12.90	13.03
	16	13.10	13.16	13.10	13.16	13.16	13.29	-99.99	-99.99	13.16	13.23
	17	13.29	13.29	13.29	13.16	13.23	13.16	13.16	13.23	13.50	13.89
	18	14.43	14.02	13.96	14.09	14.22	14.16	14.02	14.02	14.09	14.16
	19	14.22	14.22	14.36	-99.99	14.36	14.29	14.36	14.36	14.43	14.56
	20	14.56	14.56	14.49	14.43	14.36	14.02	13.89	13.83	13.63	13.23
	21	13.10	13.03	12.90	12.77	12.50	12.37	12.24	12.04	11.97	11.97
	22	11.91	11.84	11.84	11.64	11.51	11.44	11.37	11.31	11.37	11.18
	23	11.11	11.04	10.91	10.78	10.64	10.64	10.25	10.12	10.05	-99.99

** NOTE ** PROVISIONAL, UNEDITED DATA, BEST ESTIMATE OF TRANSFER EQUATIONS AT TIME OF PROCESSING ** NOTE **

** NOTE ** -99.99 DENOTES MISSING DATA ** NOTE **

Figure 5-3.--Two-day sample of 6-min observations.

5.3 PDCS Final Data Set

Further editing, both manual and automatic, was done to produce the final data set. Manual editing consisted of studying the PDCS Event Logs and the provisional graphical displays, and deleting incorrect data. The first step in the automatic editing was to pass each parameter through windows or ranges of acceptable values. Any value falling outside the sensor's range, or judged unacceptable in terms of the physical world, was deleted.

Hourly averages ($\overline{x}$) for air and water temperature, atmospheric pressure, pan evaporation, and dewpoint were computed in the usual manner, i.e.,

$$\overline{x} = \frac{\Sigma\, x_i}{n} \quad .$$

The standard deviation of the average was also computed, based on a sample set beginning 30 min before the hour and ending 29 min after the hour. Every observation that deviated from the average by more than 3.0 times the standard deviation was deleted from the sample set, and a new average was computed. This procedure was iterated until no two successive averages ($\overline{x}_i$ and $\overline{x}_{i+1}$) differed by less than the sensor's resolution or until only 50 percent of the beginning number of observations remained. The resulting hourly averages ($\overline{x}_i$), their associated standard deviations, and number of observations used are contained in the final archive product.

Hourly averages for wind and current speed and direction were computed from

$$v = (\bar{u}^2 + \bar{v}^2)^{\frac{1}{2}} \quad ,$$

$$\overline{D} = \tan^{-1}\left(\frac{\bar{u}}{\bar{v}}\right) \quad ,$$

where

$$\bar{u} = \frac{\Sigma\, u}{n} \, ,$$

$$\bar{v} = \frac{\Sigma\, v}{n} \, ,$$

$$n \le 10 \, ,$$

$$u = -s_o\ (\sin d_o) \, ,$$

$$v = -s_o\ (\cos d_o) \, ,$$

s_o = observed speed, and

d_o = observed direction.

When either s_o or d_o was missing for any 6-min observation, the entire observation was treated as missing.

For precipitation and radiation, no hourly averages were computed, only hourly totals.

The final PDCS data set consists of the following:

(1) Microfilm graphics of each day's data for each sensor. As shown in figure 5-4, each frame is divided into three segments: title and location information; unedited 6-min provisional data for 1 day; and edited 6-min observations for the same day and sensor.

(2) Time-series graphics of the edited data on microfilm.

(3) Microfilm displays of the hourly averages (or hourly totals), and standard deviations and the number of observations used.

(4) Seven-track BCD tapes (one per 8-day period) of the edited data.

6. ARCHIVE FORMAT AND DATA INVENTORY

6.1 Provisional Data Tape Format

One day for one station for one sensor constitutes a 2,170-character record. There are 10 characters of identification followed by 240 fields of data containing nine characters each.

The tapes were generated using FORTRAN. Fields are right justified with high order positions blank filled.

The following notations are used:

x = any numeric or alphanumeric character
– = an "11" punch in the card or the equivalent tape configuration
Δ = blank configuration on tape
Field = any position or group of positions used to describe an element

The data record is as follows:

	STN #	SN ID	YEAR	JUL DAT	DATA				
					MIN 00	MIN +06	MIN +12	MIN +18	MIN +24
	xxx	xx	xx	xxx	xxxxx.xxx	xxxxx.xxx	xxxxx.xxx	xxxxx.xxx	xxxxx.xxx
Field number	001	002	003	004	005	006	007	008	009

	DATA	
	MIN +1428	MIN +1434
	xxxxx.xxx	xxxxx.xxx
Field number	243	244

INTERNATIONAL FIELD YEAR FOR THE GREAT LAKES - PHYSICAL DATA COLLECTION SYSTEM   GENERATION OATE 11/23/74 11.00.56
IFYGL STATION 22   PLATFORM   LAND STATION (NIAGARA)   PARAMETER AIR TEMPERATURE   FRAME NO
LATITUDE 43 16 21   LONGITUOE 79 00 21   HEIGHT/OEPTH 1.5 M.   UNITS OEG C

1 SEP 1972
245

** NOTE **			PROVISIONAL, UNEDITEO OATA						** NOTE **	
MINUTE	30	36	42	48	54	00	06	12	18	24
HOUR										
0	-999.00	-999.00	-999.00	-999.00	-999.00	21.81	21.42	21.23	21.36	21.36
1	20.97	20.71	20.52	20.26	20.45	20.26	20.39	20.39	20.33	19.61
2	19.48	18.76	18.82	17.90	17.77	18.63	19.02	19.09	19.28	19.09
3	18.89	18.56	17.97	18.37	18.04	17.84	17.38	16.85	17.12	17.12
4	17.19	16.98	16.92	16.72	16.66	16.66	16.66	16.72	17.12	17.38
5	17.25	17.64	17.84	18.24	18.30	18.04	18.30	18.56	18.56	18.76
6	18.96	19.35	18.96	18.89	18.89	18.89	18.76	18.69	18.89	18.82
7	18.89	18.76	18.63	18.96	19.15	19.02	19.02	18.89	19.02	18.96
8	19.02	18.82	18.89	18.82	18.96	18.96	18.82	18.96	19.09	-999.00
9	-999.00	18.89	18.96	18.82	18.82	18.96	19.02	18.89	18.63	18.76
10	18.89	18.82	18.69	18.76	18.63	18.69	18.69	18.63	18.43	18.63
11	18.56	18.43	18.56	18.50	18.43	18.63	18.69	18.82	18.96	19.02
12	19.09	19.22	19.22	19.41	19.48	19.94	20.13	20.26	20.33	20.71
13	20.91	21.04	21.16	21.48	21.75	21.94	22.07	22.51	22.65	22.84
14	22.91	23.10	23.35	23.55	23.29	23.62	23.68	24.13	24.00	24.00
15	24.25	24.25	24.58	24.71	25.16	25.35	25.03	25.16	25.29	25.74
16	25.67	26.19	25.87	26.13	26.64	26.38	26.38	26.70	27.67	27.03
17	27.22	27.09	27.35	27.03	27.60	27.79	27.93	27.41	27.41	27.79
18	28.12	27.73	27.86	27.86	28.18	27.93	28.31	28.63	28.06	-999.00
19	-999.00	28.63	28.96	28.76	28.12	28.37	28.50	28.25	28.57	28.44
20	28.25	28.31	28.76	28.25	28.63	28.37	28.63	28.57	28.18	28.12
21	28.18	28.25	28.31	28.12	28.12	27.86	27.86	27.79	27.99	27.67
22	27.67	27.60	27.67	27.54	27.35	27.35	27.16	27.03	27.03	26.70
23	26.57	26.70	26.25	25.80	25.67	25.42	25.09	24.77	24.06	24.13
** NOTE **			-999.00 DENOTES MISSING OATA						** NOTE **	

** NOTE **			FINAL EOITED OATA						** NOTE **	
MINUTE	30	36	42	48	54	00	06	12	18	24
0	-99.99	-99.99	-99.99	-99.99	-99.99	21.81	21.42	21.23	21.36	21.36
1	20.97	20.71	20.52	20.26	20.45	20.26	20.39	20.39	20.33	19.61
2	19.48	18.76	18.82	17.90	17.77	18.63	19.02	19.09	19.28	19.09
3	18.89	18.56	17.97	18.37	18.04	17.84	17.38	16.85	17.12	17.12
4	17.19	16.98	16.92	16.72	16.66	16.66	16.66	16.72	17.12	17.38
5	17.25	17.64	17.84	18.24	18.30	18.04	18.30	18.56	18.56	18.76
6	18.96	19.35	18.96	18.89	18.89	18.89	18.76	18.69	18.89	18.82
7	18.89	18.76	18.63	18.96	19.15	19.02	19.02	18.89	19.02	18.96
8	19.02	18.82	18.89	18.82	18.96	18.96	18.82	18.96	19.09	-99.99
9	-99.99	18.89	18.96	18.82	18.82	18.96	19.02	18.89	18.63	18.76
10	18.89	18.82	18.69	18.76	18.63	18.69	18.69	18.63	18.43	18.63
11	18.56	18.43	18.56	18.50	18.43	18.63	18.69	18.82	18.96	19.02
12	19.09	19.22	19.22	19.41	19.48	19.94	20.13	20.26	20.33	20.71
13	20.91	21.04	21.16	21.48	21.75	21.94	22.07	22.51	22.65	22.84
14	22.91	23.10	23.35	23.55	23.29	23.62	23.68	24.13	24.00	24.00
15	24.25	24.25	24.58	24.71	25.16	25.35	25.03	25.16	25.29	25.74
16	25.67	26.19	25.87	26.13	26.64	26.38	26.38	26.70	27.67	27.03
17	27.22	27.09	27.35	27.03	27.60	27.79	27.93	27.41	27.41	27.79
18	28.12	27.73	27.86	27.86	28.18	27.93	28.31	28.63	28.06	-99.99
19	-99.99	28.63	28.96	28.76	28.12	28.37	28.50	28.25	28.57	28.44
20	28.25	28.31	28.76	28.25	28.63	28.37	28.63	28.57	28.18	28.12
21	28.18	28.25	28.31	28.12	28.12	27.86	27.86	27.79	27.99	27.67
22	27.67	27.60	27.67	27.54	27.35	27.35	27.16	27.03	27.03	26.70
23	26.57	26.70	26.25	25.80	25.67	25.42	25.09	24.77	24.06	24.13
** NOTE **			-99.99 DENOTES EOITED OATA						** NOTE **	

Figure 5-4.--Sample of daily data.

Tape field number	Tape positions	Number characters	Element
001	01-03	3	Station number - PDCS
002	04-05	2	Sensor indicator (position number)
003	06-07	2	Year
004	08-10	3	Julian day
005-244	11-2170	240 fields - 9 per field	Data: Air temperature Dewpoint temperature Atmospheric pressure Longwave radiation Shortwave radiation Pan evaporation Water temperature (evaporation pan) Precipitation Wind speed Wind direction Water temperature Current speed Current direction

Tape field number	Element	Tape configuration	Code definition and remarks
001	Station number - PDCS	2-21	PDCS station number (see station list in sec. 2.2.1, p. 4)
002	Sensor indicator (position number)	1-42	Sensor indicator (see table 2-3, sec. 2.2.1, p. 6)
003	Year	72 or 73	Year: 72 = 1972 73 = 1973
004	Julian day	001-366	Julian day in given year.
005-244	Data:		
	Air temperature	-25.000-40.000	Temperature of air in degrees Celsius to hundredths. Right position zero filled.

Tape field number	Element	Tape configuration	Code definition and remarks
	Dewpoint temperature	-25.000-40.000	Dewpoint in degrees Celsius to hundredths. Right position zero filled.
	Atmospheric pressure	950.000-1050.000	Atmospheric pressure in millibars to hundredths. Right position zero filled.
	Longwave radiation	0.000-4.000	Longwave radiation in langleys per minute to thousandths.
	Shortwave radiation	0.000-2.000	Shortwave radiation in langleys per minute to thousandths.
	Pan evaporation	-10.000-10.000	Change in water level with respect to full pan in centimeters to thousandths.
	Water temperature (evaporation pan)	-2.000-40.000	Evaporation pan water temperature in degrees Celsius to hundredths. Right position zero filled.
	Precipitation	0.000-1.575	Amount of precipitation in centimeters per 6 min to 25 thousandths.
	Wind speed	0.000-50.000	Wind speed in meters per second to tenths. Two right positions zero filled.
	Wind direction	0.000-360.000	Direction from which wind is moving with respect to true north in degrees to tenths. Two right positions zero filled.
	Water temperature	-2.000-30.000	Temperature of water in degrees Celsius to hundredths. Right position zero filled.

Tape field number	Element	Tape configuration	Code definition and remarks
	Current speed	0.000-100.00	Current speed in centimeters per second to tenths. Two right positions zero filled.
	Current direction	0.000-360.000	Direction toward which water is moving with respect to true north in degrees to tenths. Two right positions zero filled.

NOTE: Missing data indicated by -999.000.

6.2 Final Data Tape Format

One day for one station for one sensor constitutes a 2,170-character record. There are 10 characters of identification followed by 240 fields of data containing nine characters each.

The tapes were generated using FORTRAN. Fields are right justified with high order positions blank filled.

The following notations are used:

x = any numeric or alphanumeric character
– = an "11" punch in the card or the equivalent tape configuration
Δ = blank configuration on tape
Field = any position or group of positions used to describe an element

The data record is as follows:

TYPE 1 : TEMPERATURES, PRESSURE AND DEW POINT

	STN	SN	YEAR	JUL DAT	TYPE	FIRST HOUR HR	MEAN	STANDARD DEV	# POINTS BEF	AFT	BLANK	SECOND HOUR HR	MEAN	STANDARD DEV	# POINTS BEF	AFT	ETC.
	xxx	xx	xxxx	xxx	1	01.	xxxx.xxx	xxxx.xxx	xx.	xx.	ΔΔΔΔΔ	Δ2.	xxxx.xxx	xxxx.xxx	xx.	xx.	
FIELD NUMBER	001	002	003	004	005	006	007	008	009	010	011	006	007	008	009	010	

TYPE 2 : VECTOR AVERAGE OF SPEED AND DIRECTION

	STN	SN	YEAR	JUL DAT	TYPE	FIRST HOUR HR	AVERAGE SPEED	AVERAGE DIR	# PTS	FILL	BLANK	SECOND HOUR HR	AVERAGE SPEED	AVERAGE DIR	# PTS	FILL	ETC.
	xxx	xx	xxxx	xxx	2	01.	xxxx.xxx	xxxx.xxx	xx.	Δ0.	ΔΔΔΔΔ	Δ2.	xxxx.xxx	xxxx.xxx	xx.	Δ0.	
FIELD NUMBER	001	002	003	004	005	006	012	013	014	015	016	006	012	013	014	015	

TYPE 3 : PRECIPITATION, RADIATION AND EVAPORATION

					FIRST HOUR						SECOND HOUR					
STN	SN	YEAR	JUL DAT	TYPE	HR	TOTAL	FILL	# PTS	FILL	BLANK	HR	TOTAL	FILL	# PTS	FILL	ETC.
xxx	xx	xxxx	xxx	3	Δ0.	xxxx.xxx	ΔΔΔ0.000	xx.	Δ0.	ΔΔΔΔΔ	Δ2.	xxxx.xxx	ΔΔΔ0.000	xx.	Δ0.	
FIELD NUMBER 001	002	003	004	005	006	017	018	019	020	021	006	017	018	019	020	

Tape field number	Tape positions	Number characters	Element
001	1-3	3	Station number
002	4-5	2	Sensor
003	6-9	4	Year
004	10-12	3	Julian day
005	13	1	Type
006	16	3	Hour
007	17-24	8	Mean
008	25-32	8	Standard deviation
009	33-35	3	Number of points before use
010	36-38	3	Number of points after hour
011	39-43	5	Blank

Fields 006 through 011 are repeated a total of 24 times (hours 01-24).

012	17-24	8	Average speed
013	25-32	8	Average direction
014	33-35	3	Total number of points
015	36-38	3	Fill
016	39-43	5	Blank

Fields 006, 012-016 are repeated a total of 24 times (hours 01-24).

017	17-24	8	Total
018	25-32	8	Fill
019	33-35	3	Total number of points
020	36-38	3	Fill
021	39-43	5	Blank

Fields 006, 017-021 are repeated a total of 24 times (hours 01-24).

Tape field number	Element	Tape configuration	Code definition and remarks
001	Station number	12-31	IFYGL station number (see station list in sec. 2.2.1, p. 4)
002	Sensor indicator (position number)	01-42	Sensor indicator (see table 2-3, sec. 2.2.1, p. 6)

Tape field number	Element	Tape configuration	Code definition and remarks
003	Year	1972 or 1973	Year
004	Julian day	001-366	Julian day in given year
005	Type	1, 2, 3	Data and format type of values in this record: 1 = temperature, pressure, and dew-point; 2 = vector average of speeds direction; 3 = precipitation, radiation, and evaporation
006	Hour	01-24	Hour of day (GMT)
	Type 1: Temperature, Pressure, Dewpoint		
007	Mean	0.000-9999.999	Mean value for hour (30 min before to 30 min after given hour) Temperature and dew-point in degrees Celsius Pressure in millibars
008	Standard deviation	0.000-9999.999	Standard deviation of values
009	Number of points before hour	0.-5.	Number of points (6-min values) used from before the hour
010	Number of points after hour	0.-5.	Number of points (6-min values) used from after the hour
011	Blank	bbbbb	Blank
	Type 2: Vector Average of Speed and Direction		
012	Average speed	0.000-9999.999	Average speed for hour: wind in meters per second;

Tape field number	Element	Tape configuration	Code definition and remarks
			current in centimeters per second
013	Average direction	0.000-9999.999	Average direction for hour: wind - direction from which air is moving with respect to true north in degrees; current - direction toward which water is moving with respect to true north in degrees
014	Total number of points	01.-10.	Total number of 6-min values used for this hour's computation
015	Filler	0.	Filler
016	Blank	bbbbb	Blank
	Type 3: Precipitation, Radiation, Evaporation		
017	Total	0.000-9999.999	Total of 6-min values for this hour
018	Filler	0.000	Filler
019	Total number of points	01.-10.	Total number of 6-min values used for this hour's computation
020	Filler	0.	Filler
021	Blank	bbbbb	Blank
			Precipitation, evaporation in centimeters per hour; radiation in langleys per hour

6.3 Data Inventory

An inventory of the provisional and final archived data sets is given in tables 6-1 through 6-7.

Table 6-1.--Provisional 6-min data (Archive control No. USA 1-100-002)

Magnetic tape No.	Beginning date	Ending date	Station and sensor (in parentheses)
089	5/1/72	5/31/72	12 (1) - 31 (11)
090	6/1/72	6/30/72	12 (1) - 23 (13)
091			23 (13) - 31 (11)
092	7/1/72	7/31/72	12 (1) - 22 (33)
093			22 (33) - 31 (11)
094	8/1/72	8/31/72	12 (1) - 22 (18)
095			22 (18) - 31 (11)
096	9/1/72	9/30/72	12 (1) - 22 (33)
097			22 (33) - 31 (11)
098	10/1/72	10/31/72	12 (1) - 23 (05)
099			23 (05) - 31 (11)
100	11/1/72	11/30/72	12 (1) - 26 (03)
101			26 (03) - 31 (11)
102	12/1/72	12/1/72	12 (1) - 31 (11)
103	1/1/73	1/1/73	12 (1) - 31 (11)
104	2/1/73	2/1/73	12 (1) - 31 (11)
105	3/1/73	3/1/73	12 (1) - 31 (11)

Table 6-2.--Provisional data listings on 16-mm microfilm (Archive control No. USA 6-100-003)

Microfilm reel No.	Beginning date	Ending date	Station
001	5/1/72	5/8/72	12 - 31
002	5/9/72	5/16/72	"
003	5/17/72	5/24/72	"
004	5/25/72	5/31/72	"
005	6/1/72	6/8/72	"
006	6/9/72	6/16/72	"
007	6/17/72	6/24/72	"
008	6/25/72	6/30/72	"
009	7/1/72	7/8/72	"
010	7/9/72	7/16/72	"
011	7/17/72	7/24/72	"
012	7/25/72	7/31/72	"
013	8/1/72	8/8/72	"
014	8/9/72	8/16/72	"
015	8/17/72	8/24/72	"
016	8/25/72	8/31/72	"
017	9/1/72	9/8/72	"
018	9/9/72	9/16/72	"
019	9/17/72	9/24/72	"
020	9/25/72	9/30/72	"

Table 6-2.--Provisional data listings on 16-mm microfilm (Archive control No. USA 6-100-003) (Continued)

Microfilm reel No.	Beginning date	Ending date	Station
021	10/1/72	10/8/82	12 - 31
022	10/9/72	10/16/72	"
023	10/17/72	10/24/72	"
024	10/25/72	10/31/72	"
025	11/1/72	11/8/72	"
026	11/9/72	11/16/72	"
027	11/17/72	11/24/72	"
028	11/25/72	11/30/72	"
057	12/1/72	12/31/72	"
058	1/1/73	1/31/72	"
059	2/1/73	2/28/73	"
060	3/1/73	3/31/73	"

Table 6-3.--Provisional time-series graphics on 35-mm microfilm (Archive control No. USA 6-100-004)

Microfilm reel No.	Beginning date	Ending date	Station
050	5/1/72	5/31/72	12 - 31
051	6/1/72	6/30/72	"
052	7/1/72	7/31/72	"
053	8/1/72	8/31/72	"
054	9/1/72	9/30/72	"
055	10/1/72	10/31/72	"
056	11/1/72	11/30/72	"
057	12/1/72	12/31/72	"
058	1/1/73	1/31/73	"
059	2/1/73	2/28/73	"
060	3/1/73	3/31/73	"

Table 6-4.--Final, edited 6-min data (Archive control No. USA 1-100-005)

Magnetic tape No.	Beginning date	Ending date	Station
045	6/13/72	11/1/72	12
	5/25/72	11/1/72	13
	6/14/72	6/27/72	14
046	6/28/72	11/17/72	14
	6/18/72	10/31/72	15

Table 6-4.--Final, edited 6-min data (Archive control No. USA 1-100-005) (Continued)

Magnetic tape No.	Beginning date	Ending date	Station
046	5/23/72	9/17/72	16
047	9/18/72	11/17/72	16
	6/15/72	11/18/72	17
	7/19/72	10/11/72	18
	6/6/72	8/6/72	19
048	8/7/72	11/4/72	19
	5/31/72	11/4/72	20
	6/7/72	2/14/72	21
049	7/15/72	11/5/72	21
	5/9/72	3/30/73	22
	6/29/72	9/13/72	23
050	9/14/72	11/6/72	23
	6/16/72	10/31/72	24
	5/4/72	3/30/72	25
	5/16/72	5/16/72	26
051	5/17/72	11/28/72	26
	6/5/72	8/8/72	27
052	8/9/72	11/16/72	27
	4/28/72	3/31/73	28
	5/2/72	2/13/73	29
053	2/14/73	3/31/73	29
	9/27/72	3/31/73	30
	5/11/72	3/31/73	31

Table 6-5.--Final, edited hourly averages (Archive control No. USA 1-100-008)

Magnetic tape No.	Beginning date	Ending date	Station
001	6/13/72	11/1/72	12
	5/25/72	11/1/72	13
	6/14/72	11/17/72	14
	7/18/72	10/31/72	15
	5/23/72	11/17/72	16
	6/15/72	11/18/72	17
	7/19/72	10/11/72	18
	6/6/72	11/4/72	19
	5/31/72	6/22/72	20
002	6/23/72	11/4/72	20
	6/7/72	11/5/72	21
	5/9/72	3/30/73	22
	6/29/72	11/6/72	23

Table 6-5.--Final, edited hourly averages (Archive control No. USA 1-100-008) (Continued)

Magnetic tape No.	Beginning date	Ending date	Station
	6/16/72	10/31/72	24
	5/4/72	3/30/72	25
	5/16/72	7/14/72	26
003	7/15/72	11/28/72	26
	6/5/72	11/16/72	27
	4/28/72	3/31/73	28
	5/2/72	3/31/73	29
	9/27/72	3/31/73	30
	5/11/72	3/31/73	31

Table 6-6.--Final, edited time-series graphics on 35-mm microfilm (Archive control No. USA 6-100-007)

Microfilm reel No.	Beginning date	Ending date	Station
001	5/1/72	5/31/72	12 - 31
002	6/1/72	6/30/72	"
003	7/1/72	7/31/72	"
004	8/1/72	8/31/72	"
005	9/1/72	9/30/72	"
006	10/1/72	10/31/72	"
007	11/1/72	11/30/72	"
008	12/1/72	12/31/72	"
009	1/1/73	1/31/73	"
010	2/1/73	2/28/73	"
011	3/1/73	3/31/73	"

Table 6-7.--Final, edited data listings of 6-min observations and hourly averages on 16-mm microfilm (Archive control No. USA 6-100-006)

Microfilm reel No.	Beginning date	Ending date	Station
001 (1 reel)	5/1/72	5/8/72	12 - 31
002 "	5/9/72	5/16/72	"
003 "	5/17/72	5/24/72	"
004 "	5/25/72	5/31/72	"

Table 6-7.--Final, edited data listings of 6-min observations and hourly averages on 16-mm microfilm (Archive control No. USA 6-100-006) (Continued)

Microfilm reel No.	Beginning date	Ending date	Station
005 (2 reels)	6/1/72	6/8/72	12 - 31
006 "	6/9/72	6/16/72	"
007 "	6/17/72	6/24/72	"
008 (3 reels)	6/25/72	6/30/72	"
009 (2 reels)	7/1/72	7/8/72	"
010 "	7/9/72	7/16/72	"
011 "	7/17/72	7/24/72	"
012 "	7/25/72	7/31/72	"
013 "	8/1/72	8/8/72	"
014 (1 reel)	8/9/72	8/16/72	"
015 (2 reels)	8/17/72	8/24/72	"
016 "	8/25/72	8/31/72	"
017 "	9/1/72	9/8/72	"
018 "	9/9/72	9/16/72	"
019 (3 reels)	9/17/72	9/24/72	"
020 (2 reels)	9/25/72	9/30/72	"
021 "	10/1/72	10/8/72	"
022 "	10/9/72	10/16/72	"
023 "	10/17/72	10/24/72	"
024 (1 reel)	10/25/72	10/31/72	"
025 (2 reels)	11/1/72	11/8/72	"
026 (1 reel)	11/9/72	11/16/72	"
027 "	11/17/72	11/24/72	"
028 "	11/25/72	11/30/72	"
029 "	12/1/72	12/8/72	"
030 "	12/9/72	12/16/72	"
031 "	12/17/72	12/24/72	"
032 "	12/25/72	12/31/72	"
033 "	1/1/73	1/8/73	"
034 "	1/9/73	1/16/73	"
035 "	1/17/73	1/24/73	"
036 "	1/25/73	1/31/73	"
037 "	2/1/73	2/8/73	"
038 "	2/9/73	2/16/73	"
039 "	2/17/73	2/24/73	"
040 "	2/25/73	2/28/73	"
041 "	3/1/73	3/8/72	"
042 "	3/9/73	3/16/73	"
043 "	3/17/73	3/24/73	"
044 "	3/25/73	3/31/73	"

APPENDIX I

Chronology of Events

APPENDIX I

Chronology of Events

Jul. day	Date (1972)	Event
061	Mar. 1	TI maintenance contract begins.
092	Apr. 1	Field Year begins.
108	Apr. 17	NOIC begins calibration of sensors.
115	Apr. 24	21-ft skiff on Lake Ontario.
119	Apr. 28	S/V Johnson arrives on Lake Ontario. Station 28 in operation.
123	May 2	Station 29 in operation.
125	May 4	Station 25 in operation.
128	May 7	USGS Maple arrives in Rochester.
130	May 9	Station 22 in operation. Filing of current maintenance reports begins at Rochester Field Data Center (RFDC).
132	May 11	Station 31 in operation.
136	May 15	Telecopier installed.
137	May 16	Station 26 in operation.
144	May 23	Station 16 in operation.
146	May 25	Station 13 in operation.
152	May 31	Station 20 in operation.
153	June 1	Filing of daily maintenance reports begins at RFDC.
154	June 2	RCC time changed from EST to GMT.
157	June 5	Station 27 in operation.
158	June 6	Station 19 in operation.
159	June 7	Station 21 in operation.

165	June 13	Calibration laboratory equipment arrive in Rochester. Station 12 in operation.
166	June 14	Station 14 in operation.
167	June 15	Station 17 in operation.
168	June 16	Station 24 in operation.
181	June 29	Station 23 in operation.
200	July 18	Station 15 in operation. Daily Summary of Missing Station report begins.
201	July 19	Station 18 in operation.
207	July 25	Weekly internal calibration report forwarded to RFDC from LSC.
208	July 26	Calibration laboratory technician arrives at RCC.
214	Aug. 1	Jayne E II leased for project use.
217	Aug. 4	Major TI spares contract awarded (electrical TEG and mechanical parts).
235	Aug. 22	Intercomparison (S/V Johnson) started.
249	Sept. 5	Wang calculator delivered for use by project (for calculation and intercomparison data reduction).
262	Sept. 18	TI spares delivered (8 percent complete); electrical parts.
265	Sept. 21	TI spares delivered (9 percent complete); mechanical parts.
271	Sept. 27	Station 30 in operation.
276	Oct. 2	TI spares delivered (25 percent complete); batteries and electrical parts.
285	Oct. 11	Station 18 terminated.
304	Oct. 30	TI spares delivered (37 percent complete); radios, TEGs, and stress members.
305	Oct. 31	TI spares delivered (80 percent complete); electrical parts. Stations 15 and 24 terminated.

306	Nov.	Stations 12 and 13 terminated.
309	Nov. 4	Stations 19 and 20 terminated.
310	Nov. 5	Station 21 terminated.
311	Nov. 6	Station 23 terminated.
321	Nov. 16	Station 27 terminated.
322	Nov. 17	Stations 14 and 16 terminated.
323	Nov. 19	Station 17 terminated.
331	Nov. 26	21-ft skiff removed from Lake Ontario.
333	Nov. 28	Station 26 terminated.
335	Nov. 30	Jayne E II returned.
338	Dec. 3	Johnson leaves Lake Ontario.
340	Dec. 5	TI spares delivered (88 percent complete); electrical parts.
350	Dec. 15	TI maintenance crew reduced from eight to two.
353	Dec. 18	TI spares delivered (96 percent complete); radios.
354	Dec. 19	Daily radiometer maintenance started at station 28.
355	Dec. 20	Calibration laboratory technician and most calibration equipment leave RCC.
364	Dec. 29	TI spares delivered (100 percent complete).
366	Dec. 31	RCC clock reset to Julian day 000.
(1973)		
023	Jan. 23	Daily radiometer maintenance started at stations 29 and 31.
031	Jan. 31	Daily radiometer maintenance started at station 25.
090	Apr. 31	PDCS data collection phase ends. Stations 22, 25, 28, 29, 30 and 31 shut down.

APPENDIX II

Station Inventory

APPENDIX II

Station Inventory

Station 12 - Buoy

Parameter		Sensor No.	Date of Installation	Date of Removal
Air temperature		1007	5/9/72	11/1/72
Air pressure		2017		8/19/72
" "		2006	"	11/1/72
Dewpoint		7002	5/9/72	11/1/72
Wind direction		8010	"	"
Water temperature	(5 m)	11059	"	"
" "	(10 m)	11060	"	"
" "	(15 m)	11061	"	"
" "	(20 m)	11062	"	"
" "	(25 m)	11063	"	"
" "	(30 m)	11064	"	"
" "	(35 m)	11065	"	"
" "	(40 m)	11066	"	"
" "	(surface)	11067	"	"
" "	(50 m)	11068	"	"
" "	(60 m)	11069	"	"
" "	(75 m)	11070	"	"
" "	(100 m)	11071	"	"
Current direction	(bottom)	13032	"	"
" "	(30 m)	13029	"	"
" "	(15 m)	13028	"	"
" "	(5 m)	13011	"	"
Current speed	(bottom)	14032	"	"
" "	(30 m)	14029	"	"
" "	(15 m)	14028	"	"
" "	(5 m)	13011	"	"

Station 13 - Buoy

Parameter		Sensor No.	Date of Installation	Date of Removal
Air temperature		1008	5/8/72	11/1/72
Air pressure		2008	"	8/18/72
" "		2007	9/21/72	11/1/72
Dewpoint		7004	5/8/72	11/1/72
Wind direction		8001	"	10/25/72
" "		8006	10/25/72	11/1/72
Wind speed		10012	5/8/72	11/1/72
Water temperature	(5 m)	10046	5/12/72	11/1/72
" "	(10 m)	10047	"	"
" "	(15 m)	11048	"	"
" "	(20 m)	11049	"	"
" "	(25 m)	11050	"	"
" "	(30 m)	11051	"	"
" "	(35 m)	11052	"	"
" "	(40 m)	11053	"	"
" "	(surface)	11054	"	"
" "	(50 m)	11055	"	"
" "	(60 m)	11056	"	"
" "	(75 m)	11057	"	"
" "	(100 m)	11058	"	"
Current direction	(5 m)	13015	"	"
" "	(15 m)	13018	"	"
" "	(30 m)	13014	"	"
" "	(bottom)	13020	"	"
Current speed	(5 m)	14015	"	"
" "	(15 m)	14018	"	"
" "	(30 m)	14014	"	"
" "	(bottom)	14020	"	"

Station 14 - Buoy

Parameter		Sensor No.	Date of Installation	Date of Removal
Air temperature		1012	5/22/72	9/12/72
Air pressure		2020	"	8/16/72
" "		2025	9/7/72	10/4/72
" "		2009	10/4/72	11/17/72
Dewpoint		7019	5/22/72	"
Wind direction		8002	"	8/26/72
" "		8013	9/7/72	11/17/72
Wind speed		10013	5/22/72	"
Water temperature	(5 m)	11147	"	"
" "	(10 m)	11148	"	"
" "	(15 m)	11149	"	"
" "	(20 m)	11150	"	"
" "	(25 m)	11151	"	"
" "	(30 m)	11152	"	"
" "	(35 m)	11153	"	"
" "	(40 m)	11154	"	"
" "	(surface)	11155	"	"
" "	(50 m)	11156	"	"
" "	(60 m)	11157	"	"
" "	(75 m)	11158	"	"
" "	(100 m)	11159	"	"
" "	(150 m)	11160	"	"
Current direction	(5 m)	13002	6/14/72	9/7/72
" "	(5 m)	13038	9/7/72	lost
" "	(15 m)	13027	6/14/72	9/7/72
" "	(15 m)	13017	9/7/72	11/17/72
" "	(30 m)	13031	6/14/72	9/7/72
" "	(bottom)	13033	"	11/17/72
Current speed	(5 m)	14002	6/14/72	9/7/72
" "	(5 m)	14038	9/7/72	lost
" "	(15 m)	14027	6/14/72	9/7/72
" "	(15 m)	14017	9/7/72	11/17/72
" "	(30 m)	14031	6/14/72	9/7/72
" "	(bottom)	14033	"	11/17/72

Station 15 - Buoy

Parameter		Sensor No.	Date of Installation	Date of Removal
Air temperature		1009	4/26/72	10/4/72
Air pressure		2002	"	8/11/72
Dewpoint		7023	"	10/4/72
Wind direction		8011	"	8/2/72
Wind speed		10006	"	10/4/72
Water Temperature	(5 m)	11175	7/13/72	10/31/72
" "	(10 m)	11176	"	"
" "	(15 m)	11177	"	"
" "	(20 m)	11178	"	"
" "	(25 m)	11179	"	"
" "	(30 m)	11180	"	"
" "	(35 m)	11181	"	"
" "	(40 m)	11182	"	"
" "	(surface)	11187	"	"
" "	(50 m)	11183	"	"
" "	(60 m)	11184	"	"
" "	(75 m)	11185	"	"
" "	(100 m)	11186	"	"
Current direction	(30 m)	13034	7/18/72	10/31/72
Current speed	(30 m)	14034	"	"

Station 16 - Buoy

Parameter		Sensor No.	Date of Installation	Date of Removal
Air temperature		1010	4/26/75	11/17/72
Air pressure		2016	"	8/11/72
" "		2021	9/6/72	9/26/72
" "		2021	10/3/72	11/17/72
Dewpoint		7017	4/26/72	"
Wind direction		8005	"	9/12/72
" "		8014	9/26/72	10/27/72
Wind speed		10011	4/26/72	11/17/72
Water temperature	(5 m)	11024	5/3/72	"
" "	(10 m)	11017	"	"
" "	(15 m)	11025	"	"
" "	(20 m)	11023	"	"
" "	(25 m)	11022	"	"
" "	(30 m)	11019	"	"
" "	(35 m)	11016	"	"
" "	(40 m)	11018	"	"
" "	(surface)	11014	"	"
" "	(50 m)	11021	"	"
" "	(60 m)	11013	"	"
" "	(75 m)	11015	"	"
" "	(100 m)	11020	"	"
Current direction	(5 m)	13007	5/23/72	10/27/72
" "	(5 m)	13027	10/27/72	11/17/72
" "	(15 m)	13008	5/23/72	10/27/72
" "	(15 m)	13035	10/27/72	11/17/72
" "	(30 m)	13009	5/23/72	10/27/72
" "	(30 m)	13037	10/27/72	11/17/72
" "	(bottom)	13001	5/23/72	"
Current speed	(5 m)	14007	5/23/72	10/27/72
" "	(5 m)	14027	10/27/72	11/17/72
" "	(15 m)	14008	5/23/72	10/27/72
" "	(15 m)	14035	10/27/72	11/17/72
" "	(30 m)	14009	5/23/72	10/27/72
" "	(30 m)	14037	10/27/72	11/17/72
" "	(bottom)	14001	5/23/72	"

Station 17 - Buoy

Parameter		Sensor No.	Date of Installation	Date of Removal
Air temperature		1011	5/24/72	11/18/72
Air pressure		2019	"	8/21/72
" "		2013	10/10/72	11/18/72
Dewpoint		7009	5/24/72	"
Wind direction		8007	"	7/11/72
" "		8004	7/17/72	10/10/72
" "		8011	10/18/72	11/18/72
Wind speed		10014	5/24/72	"
Water temperature	(5 m)	11114	5/30/72	"
" "	(10 m)	11115	"	"
" "	(15 m)	11116	"	"
" "	(20 m)	11117	"	"
" "	(25 m)	11118	"	"
" "	(30 m)	11119	"	"
" "	(35 m)	11120	"	"
" "	(40 m)	11121	"	"
" "	(surface)	11122	"	"
" "	(50 m)	11123	"	"
" "	(60 m)	11124	"	"
" "	(75 m)	11125	"	"
" "	(100 m)	11126	"	"
" "	(150 m)	11127	"	"
Current direction	(5 m)	13006	6/15/72	lost
" "	(15 m)	13030	"	11/18/72
" "	(30 m)	13004	"	"
" "	(bottom)	13005	"	lost
Current speed	(5 m)	14006	"	"
" "	(15 m)	14030	"	11/18/72
" "	(30 m)	14004	"	"
" "	(bottom)	14005	"	lost

Station 18 - Buoy

Parameter		Sensor No.	Date of Installation	Date of Removal
Air temperature		1016	5/23/72	10/11/72
Air pressure		2007	"	8/16/72
Dewpoint		7016	"	10/11/72
Wind direction		8003	"	7/3 /72
" "		8006	7/14/72	10/11/72
Wind speed		10007	5/23/72	7/17/72
" "		10023	7/17/72	10/11/72
Water temperature	(5 m)	11161	7/13/72	"
" "	(10 m)	11162	"	"
" "	(15 m)	11163	"	"
" "	(20 m)	11164	"	"
" "	(25 m)	11165	"	"
" "	(30 m)	11166	"	"
" "	(35 m)	11167	"	"
" "	(40 m)	11168	"	"
" "	(surface)	11169	"	"
" "	(50 m)	11170	"	"
" "	(60 m)	11171	"	"
" "	(75 m)	11172	"	"
" "	(100 m)	11173	"	"
" "	(150 m)	11174	"	"
Current direction	(30 m)	13036	9/19/72	10/11/72
Current speed	(30 m)	14036	"	"

Station 19 - Buoy

Parameter		Sensor No.	Date of Installation	Date of Removal
Air temperature		1015	5/15/72	11/4/72
Air pressure		2005	"	8/11/72
" "		2001	10/27/72	11/4/72
Dewpoint		7012	5/15/72	"
Wind direction		8008	"	10/26/72
Wind speed		10020	"	6/6/72
" "		10017	6/6/72	11/4/72
Water temperature	(5 m)	11073	5/18/72	"
" "	(10 m)	11074	5/18/72	"
" "	(15 m)	11075	"	"
" "	(20 m)	11076	"	"
" "	(25 m)	11077	"	"
" "	(30 m)	11078	"	"
" "	(35 m)	11079	"	"
" "	(40 m)	11080	"	"
" "	(surface)	11081	"	"
" "	(50 m)	11082	"	"
" "	(60 m)	11083	"	"
" "	(75 m)	11084	"	"
" "	(100 m)	11085	"	"
Current direction	(5 m)	13012	6/6/72	lost
" "	(15 m)	13025	"	11/4/72
" "	(30 m)	13010	"	"
" "	(bottom)	13021	"	"
Current speed	(5 m)	14012	"	lost
" "	(15 m)	14025		11/4/72
" "	(30 m)	14010	"	"
" "	(bottom)	14021	"	"

Station 20 - Buoy

Parameter		Sensor No.	Date of Installation	Date of Removal
Air temperature		1014	5/15/72	10/27/72
Air pressure		2004	"	8/11/72
" "		2002	9/6/72	11/14/72
Dewpoint		7001	5/15/72	"
Wind direction		8009	5/15/72	7/31/72
" "		8007	7/31/72	8/11/72
" "		8012	9/18/72	11/4/72
Wind speed		10016	5/15/72	7/31/72
" "		10022	7/21/72	11/4/72
Water temperature	(5 m)	11086	5/17/72	11/4/72
" "	(10 m)	11087	"	"
" "	(15 m)	11088	"	"
" "	(20 m)	11089	"	"
" "	(25 m)	11090	"	"
" "	(30 m)	11091	"	"
" "	(35 m)	11092	"	"
" "	(40 m)	11093	"	"
" "	(surface)	11094	"	"
" "	(50 m)	11095	"	"
" "	(60 m)	11096	"	"
" "	(75 m)	11097	"	"
" "	(100 m)	11098	"	"
" "	(150 m)	11099	"	"
Current direction	(5 m)	13016	5/31/72	lost
" "	(15 m)	13023	"	11/4/72
" "	(30 m)	13013	"	"
" "	(botton)	13024	"	"
Current speed	(5 m)	14016	5/31/72	lost
" "	(15 m)	14023	"	"
" "	(30 m)	14013	"	11/4/72
" "	(bottom)	14024	"	lost

Station 21 - Buoy

Parameter		Sensor No.	Date of Installation	Date of Removal
Air temperature		1006	5/16/72	11/5/72
Air pressure		2001	"	8/11/72
" "		2008	9/20/72	11/5/72
Dewpoint		7011	5/16/72	"
Wind Direction		8006	"	6/29/72
" "		8003	7/3/72	8/11/72
" "		8003	9/23/72	11/5/72
Wind speed		10017	5/16/72	6/6/72
" "		10020	6/7/72	11/5/72
Water temperature	(5 m)	11100	5/16/72	"
" "	(10 m)	11101	"	"
" "	(15 m)	11102	"	"
" "	(20 m)	11103	"	"
" "	(25 m)	11104	"	"
" "	(30 m)	11105	"	"
" "	(35 m)	11106	"	"
" "	(40 m)	11107	"	"
" "	(surface)	11108	"	"
" "	(50 m)	11109	"	"
" "	(60 m)	11110	"	"
" "	(75 m)	11111	"	"
" "	(100 m)	11112	"	"
Current direction	(5 m)	13026	6/7/72	11/5/72
" "	(15 m)	13003	"	"
" "	(30 m)	13022	"	"
" "	(bottom)	13019	"	"
Current speed	(5 m)	14026	"	"
" "	(15 m)	14003	"	"
" "	(30 m)	14022	"	"
" "	(bottom)	14019	"	"

Station 22 - Land

Parameter		Sensor No.	Date of Installation	Date of Removal
Air temperature		1001	5/9/72	1/3/73
" "		1020	1/3/72	4/2/73
Air pressure		2010	5/9/72	9/13/72
" "		2015	9/13/72	1/3/73
" "		2020	1/3/72	1/19/73
" "		2023	1/19/73	2/6/73
" "		2018	2/6/73	2/20/73
" "		2020	2/20/73	3/1/73
" "		2007	3/1/73	3/21/73
" "		2003	3/21/73	4/2/73
Precipitation		4003	6/21/72	4/2/73
Longwave radiation	(incident)	5005	5/9/72	1/3/72
" "	(reflected)	5002	1/3/73	4/2/73
Shortwave radiation	(incident)	6011	5/9/73	"
" "	(reflected	6017	"	"
Dewpoint		7022	"	"
Wind direction		9001	"	1/3/73
" "		9012	1/3/73	4/2/73
Wind speed		10003	5/9/72	1/3/73
" "		10014	1/3/73	4/2/73

Station 23 - Deepwater Tower

Parameter	Sensor No.	Date of Installation	Date of Removal
Air temperature	1017	6/29/72	11/6/72
Air pressure	2001	"	8/17/72
" "	2010	10/13/72	11/6/72
Precipitation	4008	6/29/72	"
Shortwave radiation (incident)	6007	"	"
" " (reflected)	6008	"	"
Dewpoint	7005	"	"
Wind direction	9003	7/31/72	10/19/72
Wind speed	10019	6/29/72	11/6/72
Water temperature (1 m)	11030	"	"
" " (2 m)	11031	"	"
" " (3 m)	11032	"	"
" " (4 m)	11033	"	"
" " (5 m)	11034	"	"
" " (7 m)	11035	"	"
" " (9 m)	11036	"	"
" " (11 m)	11037	"	"
" " (13 m)	11038	"	"
" " (15 m)	11039	"	"
" " (17 m)	11040	"	"
" " (19 m)	11041	"	"
Current speed and direction (3 m)	15008	6/29/72	11/6/72
" " " (4 m)	15012	"	"
" " " (5 m)	15011	"	"
" " " (2 m)	15013	10/13/72	"

Station 24 - Shallow-Water Tower

Parameter	Sensor No.	Date of Installation	Date of Removal
Air temperature	1002	6/16/72	10/31/72
Air pressure	2018	6/20/72	8/17/72
" "	2018	9/13/72	10/13/72
" "	2014	10/13/72	10/31/72
Precipitation	4009	6/16/72	"
Shortwave radiation (incident)	6005	"	"
" " (reflected)	6014	"	10/24/72
Dewpoint	7013	"	10/31/72
Wind direction	9005	6/20/72	"
Wind speed	10018	6/16/72	"
Water temperature (1 m)	11042	6/20/72	"
" " (2 m)	11043	"	"
" " (3 m)	11044	"	"
" " (4 m)	11045	"	"
Current speed and direction (1 m)	15009	"	"
" " " (2 m)	15010	"	"

Station 25 - Land

Parameter	Sensor No.	Date of Installation	Date of Removal
Air temperature	1007	5/4/72	11/29/72
" "	1007	11/29/72	4/3/73
Air pressure	2003	5/4/72	8/17/72
" "	2020	9/13/72	11/29/72
" "	2007	11/29/72	1/3/73
" "	2019	1/3/73	2/6/73
" "	2010	2/6/73	2/20/73
" "	2011	2/20/73	3/7/73
" "	2015	3/7/73	3/21/73
" "	2008	3/21/73	4/3/73
Precipitation	4004	6/21/72	"
Longwave radiation (incident)	5002	5/4/72	6/2/72
" " "	5012	8/8/72	11/28/72
" " "	5016	12/14/72	4/3/73
Shortwave radiation (incident)	6012	5/4/72	7/27/72
" " "	6013	7/27/72	4/3/73
" " (reflected)	6013	5/4/72	7/27/72
" " "	6020	8/8/72	4/3/73
Dewpoint	7010	5/4/72	6/21/72
"	7020	6/21/72	8/16/72
"	7010	8/18/72	4/3/73
Wind direction	9009	5/4/72	1/3/73
" "	9004	1/3/73	4/3/73
Wind speed	10002	5/4/72	1/3/73
" "	10025	1/3/72	4/3/73

Station 26 - Deepwater Tower

Parameter	Sensor No.	Date of Installation	Date of Removal
Air temperature	1013	5/3/72	11/28/72
Air pressure	2015	5/12/72	8/23/72
" "	2022	9/7/72	10/11/72
" "	2022	10/18/72	11/30/72
Precipitation	4001	5/12/72	"
Longwave radiation (incident)	5006	5/3/72	10/6/72
" " "	5013	10/6/72	11/30/72
" " (reflected)	5007	5/3/72	"
Shortwave radiation (incident)	6009	"	"
" " (reflected)	6016	"	"
Dewpoint	7008	5/12/72	"
Wind direction	9002	5/3/72	"
Wind speed	10008	"	"
Water temperature (1 m)	11001	5/12/72	"
" " (2 m)	11002	"	"
" " (3 m)	11003	"	"
" " (4 m)	11004	"	"
" " (5 m)	11005	"	"
" " (7 m)	11006	"	"
" " (9 m)	11011	"	"
" " (11 m)	11010	"	"
" " (13 m)	11009	"	"
" " (15 m)	11008	"	"
" " (17 m)	11007	"	"
" " (19 m)	11012	"	"
Current speed and direction (1 m)	15005	"	"
" " " (2 m)	15001	"	"
" " " (3 m)	15003	"	"
" " " (4 m)	15002	"	"
" " " (5 m)	15004	"	"

Station 27 - Shallow-Water Tower

Parameter	Sensor No.	Date of Installation	Date of Removal
Air temperature	1003	6/5/72	11/16/72
Air pressure	2006	"	8/23/72
" "	2011	9/7/72	10/11/72
" "	2005	10/18/72	11/16/72
Precipitation	4004	6/5/72	"
Longwave radiation (incident)	5001	"	"
" " (reflected)	5009	"	"
Shortwave radiation (incident)	6006	"	"
" " (reflected)	6010	"	"
Dewpoint	7003	"	"
Wind direction	9004	"	"
Wind speed	10009	"	"
Water temperature (1 m)	11026	"	"
" " (2 m)	11027	"	"
" " (3 m)	11028	"	"
" " (4 m)	11029	"	"
Current speed and direction (1 m)	15006	"	"
" " " (2 m)	15007	"	"

Station 28 - Land

Parameter	Sensor No.	Date of Installation	Date of Removal
Air temperature	1022	4/28/72	9/12/72
" "	1022	9/19/72	4/4/73
Air pressure	2009	4/28/72	9/12/72
" "	2023	9/12/72	9/29/72
" "	2023	10/10/72	1/5/73
" "	2009	1/5/73	2/9/73
" "	2003	2/9/73	2/23/73
" "	2008	2/23/73	3/9/73
" "	2009	3/9/73	3/23/73
" "	2019	3/23/73	4/4/73
Precipitation	4002	6/22/72	4/2/73
Longwave radiation (incident)	5004	4/28/72	9/12/72
" " "	5015	9/12/72	1/5/73
" " "	5010	1/5/73	4/2/73
Shortwave radiation (incident)	6018	4/28/72	"
" " (reflected)	6002	"	"
Dewpoint	7018	"	4/4/73
Wind direction	9008	"	1/5/73
" "	9002	1/8/73	4/4/73
Wind speed	10004	4/28/72	9/29/72
" "	10004	10/10/72	4/4/73

Station 29 - Land

Parameter	Sensor No.	Date of Installation	Date of Removal
Air temperature	1019	5/2/72	12/1/72
" "	1002	12/1/72	4/4/73
Air pressure	2013	5/2/72	9/5/72
" "	2004	9/5/72	12/1/72
" "	2010	12/1/72	1/9/73
" "	2022	1/9/73	1/23/73
" "	2011	1/23/73	2/14/73
" "	2022	2/14/73	2/27/73
" "	2003	2/27/73	3/13/73
" "	2018	3/13/73	3/26/73
" "	2004	3/26/73	4/4/73
Precipitation	4006	6/22/72	"
Longwave radiation (incident)	5003	5/2/72	8/7/72
" " "	5014	8/10/72	12/6/72
" " "	5013	12/13/72	4/4/73
Shortwave radiation (incident)	6001	5/2/72	1/23/73
" " "	6021	1/23/73	4/4/73
" " (reflected)	6015	5/2/72	"
Dewpoint	7006	"	"
Wind direction	9003	"	6/7/72
" "	9007	6/7/72	1/16/73
" "	9003	1/16/73	4/4/73
Wind speed	10010	5/2/72	9/27/72
" "	10007	10/23/72	3/13/73
" "	10012	3/13/73	4/4/73

Station 30 - Island

Parameter	Sensor No.	Date of Installation	Date of Removal
Air temperature (1.5 m)	1012	9/27/72	11/30/72
" " "	1017	11/30/72	4/9/73
" " (10 m)	1005	9/27/72	1/25/73
" " "	1021	1/25/73	4/9/73
Air pressure	2019	9/27/72	11/30/72
" "	2018	11/30/72	1/25/73
" "	2015	1/25/73	2/28/73
" "	2004	2/28/73	3/20/73
" "	2020	3/20/73	4/9/73
Precipitation	4010	10/26/72	"
Longwave radiation (incident)	5017	1/25/73	"
" " (reflected)	5008	"	"
Shortwave radiation (incident)	6014	10/26/72	1/25/73
" " "	6010	1/25/73	4/9/73
" " (reflected)	6019	10/26/72	1/25/73
" " "	6005	1/25/73	4/9/73
Dewpoint (1.5 m)	7015	9/27/72	11/30/72
" "	7026	11/30/72	4/9/73
" (10 m)	7021	9/27/72	1/25/73
" "	7013	1/25/73	4/9/73
Wind direction	9006	9/27/72	1/25/73
" "	9011	1/25/73	4/9/73
Wind speed (1.5 m)	10024	9/27/72	11/30/72
" " "	10022	11/30/72	4/9/73
" " (evaporation pan)	10021	9/27/72	11/30/72
" " (10 m)	10015	"	"
" " "	10010	11/30/72	4/9/73
Water temperature (1 m)	11142	9/1/72	"
" " (evaporation pan)	12143	"	11/30/72
" "	12145	11/30/72	4/9/73

Station 31 - Land

Parameter	Sensor No.	Date of Installation	Date of Removal
Air temperature	1018	5/11/72	12/1/72
" "	1016	12/1/72	4/3/73
Air pressure	2014	5/11/72	9/27/72
" "	2017	9/27/72	12/1/72
" "	2008	12/1/72	1/22/73
" "	2004	1/22/73	2/13/73
" "	2023	2/13/73	2/26/73
" "	2019	2/26/73	3/12/73
" "	2011	3/12/73	4/3/73
Precipitation	4005	6/22/72	"
Longwave radiation (incident)	5008	5/11/72	7/25/72
" " (reflected)	5011	9/28/72	4/3/73
Shortwave radiation (incident)	6004	5/11/72	"
" " (reflected)	6003	"	"
Dewpoint	7014	"	12/1/72
"	7023	12/1/72	1/22/73
"	7012	1/22/73	4/3/73
Wind direction	9010	5/11/72	1/23/73
" "	9001	1/23/73	2/13/73
" "	9009	2/13/73	4/3/73
Wind speed	10001	5/11/72	"

APPENDIX III

Factors Affecting Data Quality

APPENDIX III

Factors Affecting Data Qaulity

Station 12 - Buoy   Lat. N: 43°34'47"   Long. W: 78°46'43"

1. Current direction (5 m) - vane found broken during recovery.
2. Current direction (15 m) - vane on unit found broken off 9/12/72.
3. Current direction (30 m) - vane reported broken off 9/12/72.
4. Current direction (143 m) - vane found bent at 60° to vertical 9/12/72.
5. Current speed (5 m) - post-recovery spindown and switch test bad; data questionable; see 1 above.
6. Current speed (15 m) - post-recovery spindown and switch test bad; data questionable; see 2 above.
7. Current speed (30 m) - see 3 abve.
8. Current speed (143 m) - see 4 above.
9. Water temperature (5 m) - actual sensor depth, 4.9 m.
10. Water temperature (10 m) - actual sensor depth 9.8 m.
11. Water temperature (15 m) - actual sensor depth, 14.5 m.
12. Water temperature (20 m) - actual sensor depth, 19.3 m.
13. Water temperature (25 m) - actual sensor depth 24.2 m.
14. Water temperature (30 m) - actual sensor depth 28.7 m.
15. Wind direction (3 m) - sensor damaged by the *Maple* during recovery, 11/1/72; post-recovery sensor evaluation not possible.
16. Wind speed (3 m) - see 15 above.
17. Lake depth, 148 m.

Station 13 - Buoy   Lat. N; 43°25'59"   Long. W: 78°44'15"

1. Current direction (15 m) - vane found broken during recovery 11/1/72.

2. Current direction (30 m) - vane found lost 11/1/72.

3. Current direction (122 m) - vane found broken 11/1/72.

4. Current speed (5 m) - switch test and spindown bad after recovery; data may be questionable.

5. Current speed (15 m) - switch test and spindown poor after recovery; data may be questionable; see 1 above.

6. Current speed (30 m) - post-operational spindown bad; data may be questionable; see 2 above.

7. Current speed (122 m) - post-field year spindown bad; data may be questionable; see 3 above.

8. Dewpoint (3 m) - TEG out 6/2 to 6/27, 1972; data useless for that period.

9. Water temperature (5 m) - actual sensor depth, 5.7 m.

10. Water temperature (10 m) - actual sensor depth, 10.2 m.

11. Water temperature (15 m) - actual sensor depth, 13.4 m.

12. Water temperature (20 m) - actual sensor depth, 19.9 m.

13. Water temperature (25 m) - actual sensor depth, 24.7 m.

14. Water temperature (30 m) - actual sensor depth, 29.2 m.

15. Wind direction (3 m) - sensor 8001 on line 5/8 to 10/25/72; damaged by S/V Johnson during recovery; sensor 8006 on line 10/25 to 11/1/72; vane loose when recovered.

16. Lake depth, 126 m.

Station 14 - Buoy   Lat. N: 43°35'32"   Long. W: 78°01'02"

1. Current direction (5 m) - sensor 13002 on line 6/14 to 9/7/72; vane lost during this period; sensor 13038 installed 9/7/72; sensor lost sometime between 9/7 and 11/17/72.

2. Current direction (15 m) - sensor 13027 on line 6/14 to 9/7/72; vane lost during this period; sensor 13017 on line 9/7 to 11/17/72; vane found broken during recovery.

3. Current direction (30 m) - vane lost.

4. Current direction (181 m) - vane found broken during recovery.

5. Current speed (5 m) - data questionable; see 1 above.

6. Current speed (15 m) - see 2 above.

7. Current speed (30 m) - post-recovery switch test bad; data questionable; see 3 above.

8. Current speed (181 m) - see 4 above.

9. Water temperature (5 m) - actual sensor depth, 4.9. m.

10. Water temperature (10 m) - actual sensor depth, 10.3 m.

11. Water termperature (15 m) - actual sensor depth, 14.8 m.

12. Water temperature (20 m) - actual sensor depth, 20.3 m.

13. Wind direction (3 m) - sensor 8002 on line 5/22 to 8/26/72; vane found loose during recovery; sensor 8013 on line 9/7 to 11/17/72; vent found bent during recovery.

14. Lake depth, 184 m.

Station 15 - Buoy   Lat. N: 43°25'24"   Long. W: 77°56'19"

1. Current direction (30 m) - vane found broken during recovery.

2. Current speed (30 m) - post-recovery spindown test bad; data may be questionable; see 1 above.

3. Dewpoint (3 m) - data qeustionable for 8/24 to 8/26/72; TEG out at end of this period.

4. Water temperature (5 m) - actual sensor depth, 5.7 m.

5. Water temperature (10 m) - actual sensor depth, 9.5 m.

6. Water temperature (15 m) - actual sensor depth, 14.0 m.

7. Water temperature (20 m) - actual sensor depth, 18.8 m.

8. Water temperature (25 m) - actual sensor depth, 23.4 m.

9. Water temperature (30 m) - actual sensor depth, 28.2 m.

10. Lake depth, 126 m.

Station 16 - Buoy   Lat. N: 43°27'36"   Long. W: 77°43'54"

1. Current direction (5 m) - sensor 13007 on line 5/23 to 10/27/72; vane found broken during recovery; sensor 13027 on line 10/27 to 11/17/72; vane found cocked at 30^{o} during recovery; data may be questionable.

2. Current direction (15 m) - vane found broken during recovery.

3. Current direction (30 m) - vane found broken during recovery; data questionable for period 5/23 to 10/27/72.

4. Current direction (129 m) - vane found broken during recovery.

5. Current speed (5 m) - switch test and post-recovery spindown bad; data questionable for period 5/23 to 10/27/72; see 1 above.

6. Current speed (15 m) - see 2 above.

7. Current speed (30 m) - post-recovery spindown bad; data may be questionable; see 3 above.

8. Current speed (129 m) - switch test bad; data questionable; see 4 above.

9. Dewpoint (3 m) - data questionable for period 6/16 to 7/17/72; TEG out at the end of the period.

10. Water temperature (5 m) - actual sensor depth, 5.3 m.

11. Water temperature (10 m) - actual sensor depth, 9.1 m.

12. Water temperature (15 m) - actual sensor depth, 13.6 m.

13. Water temperature (20 m) - actual sensor depth, 19.5 m.

14. Water temperature (25 m) - actual sensor depth, 24.3 m.

15. Water temperature (30 m) - actual sensor depth 28.3 m.

16. Wind direction (3 m) - vane found broken during recovery 10/27/72.

17. Lake depth, 133 m.

Station 17 - Buoy   Lat. N: 43°36'07"   Long. W: 77°23'51"

1. Air pressure (3 m) - calibration indicated erratic sensor output; on line 10/10 to 11/18/72.

2. Current direction (5 m) - sensor installed 6/15/72; lost sometime thereafter.

3. Current direction (15 m) - vane found broken during recovery.

4. Current direction (30 m) - see 3 above.

5. Current direction (149 m) - installed 6/15/72; lost sometime thereafter.

6. Current speed (5 m) - see 2 above.

7. Current speed (15 m) - see 3 above.

8. Current speed (30 m) - post-recovery spindown bad; data questionable; see 3 above.

9. Current speed (149 m) - see 5 above.

10. Dewpoint (3 m) - data questionable for period 8/23 to 8/29/72; TEG out at end of period.

11. Water temperature (5 m) - actual sensor depth, 4.9 m.

12. Water temperature (10 m) - actual sensor depth, 9.6 m.

13. Water temperature (15 m) - actual sensor depth, 14.4 m.

14. Water temperature (20 m) - actual sensor depth, 19.4 m.

15. Water temperature (25 m) - actual sensor depth, 24.5 m.

16. Water temperature (75 m) - sensor putput very erratic; data questionable.

17. Wind direction (3 m) - vane found broken during recovery.

18. Lake depth, 157 m.

Station 18 - Buoy   Lat. N: 43°26'24"   Long. W: 76°56'46"

1. Water temperature (surface) - sensor output very erratic: data may be questionable.
2. Water temperature (5 m) - actual sensor depth, 5.5 m.
3. Water temperature (10 m) - actual sensor depth, 9.8 m.
4. Water temperature (15 m) - actual sensor depth, 14.2 m.
5. Water temperature (20 m) - actual sensor depth 19. 7 m.
6. Water temperature (25 m) - actual sensor depth 24.8 m.
7. Water temperature (30 m) - actual sensor depth, 29.5 m.
8. Wind speed (3 m) - sensor 10007 on line 5/23 to 7/1/72; defective when recovered; sensor 10023 on line 7/17 to 10/11/72; hit by the Maple in recovery operation and lost in lake.
9. Lake depth, 186 m.

Station 19 - Buoy   Lat. N: 43°41'41"   Long. W: 76°44'36"

1. Current direction (5 m) - sensor on line 6/6/72; lost sometime thereafter.
2. Current direction (15 m) - vane found broken during recovery.
3. Current direction (30 m) - see 2 above.
4. Current direction (131 m) - see 2 above.
5. Current speed (5 m) - see 1 above.
6. Current speed (15 m) - post-recovery spindown bad; data questionable; see 2 above.
7. Current speed (30 m) - see 2 above.
8. Current speed (131 m) - see 2 above.
9. Water temperature (5 m) - actual sensor depth, 4.2 m.
10. Water temperature(10 m) - actual sensor depth, 9.6 m.
11. Water temperature (15 m) - actual sensor depth, 13.8 m
12. Water temperature (20 m) - actual sensor depth, 18.9 m.
13. Water temperature (25 m) - actual sensor depth, 23.7 m.
14. Wind direction (3 m) - vane found broken during recovery.
15. Lake depth, 131 m.

Station 20 - Buoy Lat. N: 43°33'00" Long. W: 76°37'57"

1. Current direction (5 m) - sensor on line 5/31/72; lost sometime thereafter.
2. Current direction (15 m) - vane found broken during recovery.
3. Current direction (30 m) - see 2 above.
4. Current direction (99 m) - see 1 above.
5. Current speed (5 m) - see 1 above.
6. Current speed (15 m) - see 2 above.
7. Current speed (30 m) - see 2 above.
8. Current speed (99 m) - see 1 above.
9. Dewpoint (3 m) - data questionable for period 10/23/ to 27/72; TEG out at end of period.
10. Water temperature (5 m) - actual sensor depth, 4.4 m.
11. Water temperature (10 m) - actual sensor depth, 9.8 m.
12. Water temperature (15 m) - actual sensor depth, 14.8 m.
13. Water temperature (20 m) - actual sensor depth, 19.8 m.
14. Water temperature (25 m) - actual sensor depth, 24.6 m.
15. Water temperature (30 m) - actual sensor depth, 28.9 m.
16. Water temperature (35 m) - actual sensor depth, 34. 4 m.
17. Wind direction (3 m) - sensor 8009 on line 5/15 to 7/31/72; damaged during recovery; sensor 8012 on line 9/18 to 11/4/72; vane found bent during recovery.
18. Wind speed (3 m) - sensor 8009 on line 5/15 to 7/31/72; damaged during recovery.
19. Lake depth, 156 m.

Station 21 - Buoy   Lat. N: 43°41'36"   Long. W: 76°26'10"

1. Current direction (5 m) - vane found broken during recovery.
2. Current direction (15 m) - see 1 above.
3. Current direction (30 m) - see 1 above.
4. Current direction (88 m) - see 1 above.
5. Current speed (5 m) - post-recovery spindown test bad; data questionable; see 1 above.
6. Current speed (15 m) - see 1 above.
7. Current speed (30 m) - see 1 above.
8. Current speed (88 m) - post-recovery switch test bad; data questionable; see 1 above.
9. Water temperature (5 m) - actual sensor depth, 4. 1 m.
10. Water temperature (10 m) - actual sensor depth, 9.4 m.
11. Water temperature (15 m) - actual sensor depth, 14.1 m.
12. Water temperature (20 m) - actual sensor depth, 19.0 m.
13. Water temperature (25 m) - actual sensor depth, 23.9 m.
14. Water temperature (30 m) - actual sensor depth, 28.8 m.
15. Wind direction (3 m) - sensor 8006 on line 5/16 to 6/29/72; defective when recovered; sensor 8003 on line 7/3 to 8/11/72; vane found damaged during recovery; serviced and replaced on line 9/22 to 11/5/72; vane found broken during recovery.
16. Lake depth, 105 m.

Station 22 - Land   Lat. N: 43°16'21"   Long. W: 79°00'21"

1. Air pressure (1.5 m) - actual sensor height, 1.3 m; calibration poor; data questionable for the period 2/5 to 2/23/73.
2. Dewpoint (1.5 m) - actual sensor height, 1.4 m.
3. Precipitation (1.5 m) - see 2 above.
4. Incident longwave radiation (2 m) - actual sensor height, 2.1 m.
5. Incident shortwave radiation (2 m) - see 2 above.
6. Reflected shortwave radiation (2 m) - actual sensor height, 1.9 m.
7. Wind direction (10 m) - actual sensor height, 9.4 m; vane found loose during recovery; data questionable for the period 5/16 to 6/21/72.
8. Wind speed (10 m) - actual sensor height, 9.3 m.
9. Station elevation, 83 m.

Station 23 - Deepwater Tower Lat. N: 43°21'26" Long. W: 78°42'49"

1. Wind direction (10 m) - moisture in sensor and pin B open; data may be questionable.

2. Lake depth, 20 m.

Station 24 - Shallow-Water Tower Lat. N: 43°20'37" Long. W: 78°42'37"

1. Wind direction (10 m) - vane found loose during recovery; data may be questionable.
2. Lake depth, 5 m.

Station 25 - Land Lat. N: 43°22'17" Long. W; 78°29'11"

1. Air pressure (1.5 m) - actual sensor height, 1.1 m; sensor 2010 on line 2/6 to 2/20/72; calibration poor after recovery; data may be questionable.

2. Dewpoint (1.5 m) - actual sensor height 1.4 m; sensor 7010 on line 5/4 to 6/21/72; heater found defective during recovery; sensor 7020 on line 6/21 to 8/16/72; burned out at time of recovery; data for both these periods may be questionable.

3. Precipitation (1.5 m) - actual sensor height, 1.6 m.

4. Longwave incident radiation (7 m) - actual sensor height 2.1 m; sensor 5002 on line 5/4 to 6/2/72 found defective during recovery; sensor 5012 operational 8/8 to 11/28/72; deposits on envelope when recovered.

5. Shortwave incident radiation (2 m) - actual sensor height, 2.1 m; coating found defective during recovery 7/27/72.

6. Shortwave reflected radiation (2 m) - actual sensor height, 1. 9 m.

7. Wind direction (10 m) - actual sensor height, 10.7 m.

8. Wind speed (10 m) - actual sensor height, 10. 6 m.

9. Station elevation, 82 m.

Station 26 - Deepwater Tower Lat. N: 43°21'42" Long. W: 77°45'17"

1. Longwave incident radiation - sensor envelope found coated during recovery 10/6/72.

2. Longwave reflected radiation - deposits found on sensor envelope during recovery 11/30/72.

3. Lake depth, 21 m.

Station 27 - Shallow-Water Tower Lat. N: 43°20'52" Long. W: 77°45'23"

1. Wind speed (10 m) - bearings found bad during recovery; data may be questionable.

2. Lake depth, 5 m.

Station 28 - Land Lat. N: 43°20'00" Long. W: 77°45'46"

1. Longwave incident radiation - (2 m) - sensor envelope found to need resurfacing during recovery 9/12/72; data may be questionable.

2. Station elevation, 78 m.

Station 29 - Land Lat. N: 43°26'02" Long. W: 76°34'02"

1. Air pressure (1.5 m) - actual sensor height, 1. 7 m.

2. Air temperature (1.5 m) - see 1 above.

3. Dewpoint (1.5 m) - see 1 above.

4. Longwave incident radiation (2 m) - actual sensor height, 2.2 m. sensor 5003 on line 5/2 to 8/7/72; found defective during recovery; sensor 5014 on line 8/10 to 12/6/72; deposits found in dome during recovery; data may be questionable.

5. Shortwave incident radiation (2 m) - actual sensor height, 2.2 m; sensor 6001 on line 5/2/72 to 1/23/73; moisture found in dome during recovery.

6. Shortwave reflected radiation (2 m) - actual sensor height, 1.7 m.

7. Wind direction (10 m) - actual sensor height, 9.2 m; sensor 9003 on line 5/2 to 5/7/72;found defective during recovery.

8. Wind speed (10 m) - actual sensor height, 9.2 m.

9. Station elevation, 111 m.

Station 30 - Island | Lat. N: 43°53'17" | Long. W: 76°26'41"

1. Station elevation, 76 m.

Station 31 - Land | Lat. N: 43°50'22" | Long. W: 76°17'53"

1. Air pressure (1.5 m) - actual sensor height, 1.3 m.
2. Air temperature (1.5 m) - actual sensor height, 1.8 m.
3. Dewpoint (1.5 m) - sctual sensor height, 1.4 m.
4. Longwave incident radiation (2 m) - sensor 5008 on line 5/11 to 7/25/72; found defective during recovery; all readings seem to be high; envelope coated.
5. Wind direction (10 m) - actual sensor height, 9.8 m; sensor became defective between 12/1 and 12/13/72; data questionable for that period.
6. Wind speed (10 m) - actual sensor height, 9.8 m; sensor 9010 on line 5/11/72 to 1/23/73; wiper found bad during recovery; sensor 9001 on line 1/23 to 2/13/73; found defective upon recovery; sensor 9003 on line 2/13 to 4/3/73; bad when recovered; data from all three periods may be questionable.
7. Station elevation, 77 m.

APPENDIX IV

Internal Calibration Values

APPENDIX IV

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
		Station 12		
01	4/1/72	0000	1.0010	-0.14
	10/1/72	0000	0.9978	-0.99
02	4/1/72	0000	1.0000	0.00
03	4/1/72	0000	1.0000	0.00
05	4/1/72	0000	1.0000	0.00
06	4/1/72	0000	1.0000	0.00
07	4/1/72	0000	1.0000	0.00
09	4/1/72	0000	1.0000	0.00
10	4/1/72	0000	0.9994	+0.23
11	4/1/72	0000	1.0054	-2.35
	8/1/72	0000	1.0054	-1.35
	9/1/72	0000	1.0022	-1.20
13	4/1/72	0000	1.0029	-0.83
14	4/1/72	0000	1.0009	-1.09
15	4/1/72	0000	1.0006	-2.26
	8/1/72	0000	1.0006	-1.26
17	4/1/72	0000	1.0000	0.00
18	4/1/72	0000	0.9990	1.10
	8/1/72	0000	1.0003	-0.02
	9/1/72	0000	0.9990	1.10
19	4/1/72	0000	0.9985	0.34
21	4/1/72	0000	0.9994	-1.14
22	4/1/72	0000	0.9976	0.83
	8/1/72	0000	0.9989	-0.29
23	4/1/72	0000	1.0003	-0.22
	8/1/72	0000	0.9990	-0.10
25	4/1/72	0000	1.0000	0.10
26	4/1/72	0000	0.9990	0.19
27	4/1/72	0000	0.9994	-0.14
	8/1/72	0000	0.9981	-0.02
29	4/1/72	0000	0.9989	-0.52
30	4/1/72	0000	1.0001	-0.21
	8/1/72	0000	0.9989	-0.09

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
31	4/1/72	0000	0.9997	0.42
	8/1/72	0000	0.9997	-0.58
33	4/1/72	0000	0.9994	0.26
	8/1/72	0000	1.0006	-0.36
34	4/1/72	0000	0.9992	0.57
	8/1/72	0000	0.9992	-0.43
35	4/1/72	0000	0.9994	0.28
	8/1/72	0000	0.9994	-0.84
		Station 13		
01	4/1/72	0000	1.0067	-0.11
02	4/1/72	0000	1.0000	0.07
03	4/1/72	0000	1.0000	0.07
05	4/1/72	0000	1.0000	0.07
06	4/1/72	0000	1.0000	0.07
07	4/1/72	0000	1.0000	0.07
09	4/1/72	0000	1.0000	0.07
10	4/1/72	0000	1.0032	-0.65
11	4/1/72	0000	1.0009	-1.56
	7/1/72	0000	1.0009	-0.54
	8/1/72	0000	1.0041	-0.69
	9/1/72	0000	1.0041	-1.70
	10/1/72	0000	1.0041	-2.70
13	4/1/72	0000	1.0044	0.09
14	4/1/72	0000	1.0004	-0.37
15	4/1/72	0000	0.9983	0.78
	7/1/72	0000	0.9995	-0.35
	10/1/72	0000	0.9983	0.78
17	4/1/72	0000	1.0000	0.07
18	4/1/72	0000	0.9994	1.05
19	4/1/72	0000	0.9999	0.91
21	4/1/72	0000	0.9978	0.81
22	4/1/72	0000	0.9986	0.83
23	4/1/72	0000	0.9996	0.44
	10/1/72	0000	0.9984	0.55

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
25	4/1/72	0000	0.9986	0.93
26	4/1/72	0000	0.9998	0.32
27	4/1/72	0000	1.0000	0.60
	7/1/72	0000	0.9988	0.72
29	4/1/72	0000	0.9989	0.61
30	4/1/72	0000	0.9978	1.20
31	4/1/72	0000	0.9991	0.98
33	4/1/72	0000	0.9983	0.87
34	4/1/72	0000	0.9987	0.92
35	4/1/72	0000	0.9997	0.32
		Station 14		
01	4/1/72	0000	1.0054	-1.26
	7/1/72	0000	1.0022	-0.10
	8/1/72	0000	1.0054	-1.26
	9/7/72	1724	1.0022	-3.11
02	4/1/72	0000	1.0001	-0.12
03	4/1/72	0000	1.0001	-0.12
05	4/1/72	0000	1.0001	-0.12
06	4/1/72	0000	1.0001	-0.12
07	4/1/72	0000	1.0001	-0.12
09	4/1/72	0000	1.0001	-0.12
10	4/1/72	0000	1.0003	-1.71
11	4/1/72	0000	1.0019	0.31
13	4/1/72	0000	1.0006	-0.73
	9/7/72	1724	1.0038	-1.89
14	4/1/72	0000	0.9988	0.61
	7/1/72	0000	1.0001	-0.51
	8/1/72	0000	0.9988	0.61
15	4/1/72	0000	0.9985	-0.94
17	4/1/72	0000	1.0001	-0.12
18	4/1/72	0000	0.9992	-0.53
19	4/1/72	0000	0.9989	0.11
21	4/1/72	0000	1.0008	-0.77
	7/1/72	0000	0.9995	-0.65

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
22	4/1/72	0000	0.9980	1.29
	9/1/72	0000	0.9992	0.17
23	4/1/72	0000	0.9985	0.84
	8/1/72	0000	0.9997	-0.28
25	4/1/72	0000	0.9998	0.52
	7/1/72	0000	1.0010	-0.60
26	4/1/72	0000	0.9989	0.11
27	4/1/72	0000	0.9989	-0.49
29	4/1/72	0000	0.9993	0.17
	7/1/72	0000	0.9993	-0.83
30	4/1/72	0000	1.0014	-1.83
	7/1/72	0000	1.0001	-1.71
31	4/1/72	0000	1.0000	-0.10
33	4/1/72	0000	0.9981	0.58
	7/1/72	0000	0.9994	-0.54
34	4/1/72	0000	1.0008	-1.17
	7/1/72	0000	0.9995	0.05
35	4/1/72	0000	0.9996	-0.26
		Station 15		
01	4/1/72	0000	1.0016	-2.08
02	4/1/72	0000	1.0002	-0.18
	8/16/72	1836	1.0000	0.00
03	4/1/72	0000	1.0002	-0.18
	8/16/72	1836	1.0000	0.00
05	4/1/72	0000	1.0002	-0.18
	8/16/72	1836	1.0000	0.00
06	4/1/72	0000	1.0002	-0.18
	8/16/72	1826	1.0000	0.00
07	4/1/72	0000	1.0002	-0.18
	8/16/72	1836	1.0000	0.00
09	4/1/72	0000	1.0002	-0.18
	8/16/72	1836	1.0000	0.00
10	4/1/72	0000	1.0045	-2.72
11	4/1/72	0000	1.0019	-2.29
13	4/1/72	0000	1.0013	-0.16

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
14	4/1/72	0000	1.0009	-2.09
15	4/1/72	0000	1.0000	0.00
17	4/1/72	0000	1.0002	-0.18
	8/16/72	1836	1.0000	0.00
18	4/1/72	0000	0.9984	0.38
19	4/1/72	0000	0.9993	-0.43
21	4/1/72	0000	0.9991	-0.30
22	4/1/72	0000	0.9987	-0.63
23	4/1/72	0000	0.9998	-0.62
25	4/1/72	0000	0.9991	-0.43
26	4/1/72	0000	1.0001	0.19
27	4/1/72	0000	1.0004	-0.74
29	4/1/72	0000	1.0009	-0.28
30	4/1/72	0000	1.0006	0.14
31	4/1/72	0000	1.0010	-0.60
33	4/1/72	0000	1.0009	-0.58
34	4/1/72	0000	1.0011	-0.71
35	4/1/72	0000	1.0001	0.19
		Station 16		
01	4/1/72	0000	1.0000	-0.20
	7/1/72	0000	0.9968	0.95
	11/11/72	1524	1.0022	-3.26
02	4/1/72	0000	0.9999	-0.02
	11/11/72	1524	1.0000	0.00
03	4/1/72	0000	0.9999	-0.02
	11/11/72	1524	1.0000	0.00
05	4/1/72	0000	0.9999	-0.02
	11/11/72	1524	1.0000	0.00
06	4/1/72	0000	0.9999	-0.02
	11/11/72	1524	1.0000	0.00
07	4/1/72	0000	0.9999	-0.02
	11/11/72	1524	1.0000	0.00
09	4/1/72	0000	0.9999	-0.02
	11/11/72	1524	1.0000	0.00

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
10	4/1/72	0000	1.0067	-1.01
	6/1/72	0000	1.0067	-2.01
	7/1/72	0000	1.0034	-1.86
	11/11/72	1524	1.0002	0.04
11	4/1/72	0000	0.9991	-0.96
	10/1/72	0000	0.9959	-0.81
	11/11/72	1524	1.0005	0.36
13	4/1/72	0000	0.9987	0.26
	7/1/72	0000	0.9987	1.26
	8/1/72	0000	0.9956	1.40
	9/1/72	0000	0.9987	0.26
	11/11/72	1524	1.0025	-1.93
14	4/1/72	0000	0.9991	-0.91
	7/1/72	0000	1.0016	-2.16
	8/1/72	0000	1.0041	-4.42
	9/1/72	0000	1.0028	-4.30
	10/1/72	0000	1.0004	-2.04
	11/11/72	1524	1.0005	-1.46
15	4/1/72	0000	1.0000	0.00
	11/11/72	1524	0.9969	1.48
17	4/1/72	0000	0.9999	-0.02
	11/11/72	1524	1.0000	0.00
18	4/1/72	0000	0.9989	-0.09
	11/11/72	1524	0.9991	0.45
19	4/1/72	0000	1.0000	-0.20
	7/1/72	0000	0.9988	-0.08
	11/11/72	1524	1.0004	-0.09
21	4/1/72	0000	1.0005	-1.35
	11/11/72	1524	0.9999	0.22
22	4/1/72	0000	1.0003	-0.72
	11/11/72	1524	1.0004	-0.09
23	4/1/72	0000	0.9993	-0.13
	10/1/72	0000	0.9980	-0.01
	11/11/72	1524	1.0004	-0.09
25	4/1/72	0000	0.9988	0.32
	7/1/72	0000	1.0000	-0.80
	10/1/72	0000	0.9988	0.32
	11/11/72	1524	1.0004	-0.09
26	4/1/72	0000	0.9999	-0.69
	11/11/72	1524	0.9996	0.13

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
27	4/1/72	0000	0.9996	-0.56
	9/1/72	0000	0.9984	-0.45
	11/11/72	1524	0.9996	0.13
29	4/1/72	0000	1.0004	-1.14
	11/11/72	1524	0.9996	0.13
30	4/1/72	0000	1.0000	0.00
31	4/1/72	0000	1.0006	-0.96
	11/11/72	1524	0.9993	0.10
33	4/1/72	0000	1.0006	0.04
	7/1/72	0000	1.0006	-0.96
	9/1/72	0000	0.9994	0.16
	11/11/72	1524	0.9994	0.13
34	4/1/72	0000	1.0004	-1.34
	11/11/72	1524	1.0003	-0.24
35	4/1/72	0000	0.9995	-0.75
	11/11/72	1524	1.0000	0.00
		Station 17		
01	4/1/72	0000	1.0041	-2.40
02	4/1/72	0000	1.0000	0.00
03	4/1/72	0000	1.0000	0.00
05	4/1/72	0000	1.0000	0.00
06	4/1/72	0000	1.0000	0.00
07	4/1/72	0000	1.0000	0.00
09	4/1/72	0000	1.0000	0.00
10	4/1/72	0000	1.0022	-1.00
11	4/1/72	0000	1.0035	-1.56
13	4/1/72	0000	1.0067	-3.02
14	4/1/72	0000	1.0000	-1.10
15	4/1/72	0000	0.9991	-3.32
	7/1/72	0000	0.9979	-0.20
17	4/1/72	0000	1.0000	0.00
18	4/1/72	0000	1.0001	-1.01
19	4/1/72	0000	0.9992	-0.33
21	4/1/72	0000	0.9999	-0.29

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
22	4/1/72	0000	1.0013	-2.02
23	4/1/72	0000	1.0006	-1.46
25	4/1/72	0000	1.0005	-0.85
26	4/1/72	0000	0.9989	0.71
27	4/1/72	0000	1.0010	-0.80
	7/1/72	0000	0.9998	-0.68
29	4/1/72	0000	1.0010	-1.40
30	4/1/72	0000	1.0005	-1.25
	8/1/72	0000	0.9993	-1.13
31	4/1/72	0000	1.0029	-3.08
	8/1/72	0000	1.0016	-2.96
	9/1/72	0000	1.0029	-3.08
33	4/1/72	0000	1.0006	-0.96
34	4/1/72	0000	1.0003	-1.82
35	4/1/72	0000	1.0001	-0.81
	8/1/72	0000	0.9989	-0.69
	9/1/72	0000	1.0001	-0.81
		Station 18		
01	4/1/72	0000	1.0012	0.24
02	4/1/72	0000	1.0000	0.00
03	4/1/72	0000	1.0000	0.00
05	4/1/72	0000	1.0000	0.00
06	4/1/72	0000	1.0000	0.00
07	4/1/72	0000	1.0000	0.00
09	4/1/72	0000	1.0000	0.00
10	4/1/72	0000	1.0006	-1.83
11	4/1/72	0000	0.9981	-1.80
13	4/1/72	0000	1.0034	-1.97
14	4/1/72	0000	0.9995	0.15
15	4/1/72	0000	0.9980	-0.92
17	4/1/72	0000	1.0000	0.00
18	4/1/72	0000	1.0011	0.19
19	4/1/72	0000	0.9985	1.14

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
21	4/1/72	0000	0.9983	1.96
22	4/1/72	0000	0.9975	2.04
23	4/1/72	0000	0.9995	0.45
25	4/1/72	0000	0.9992	0.77
26	4/1/72	0000	0.9983	0.96
27	4/1/72	0000	0.9998	0.02
29	4/1/72	0000	1.0008	-0.17
30	4/1/72	0000	1.0000	0.00
31	4/1/72	0000	1.0001	0.29
33	4/1/72	0000	0.9999	0.91
34	4/1/72	0000	1.0008	0.23
35	4/1/72	0000	0.9999	0.11
		Station 19		
01	4/1/72	0000	1.0019	-0.79
02	4/1/72	0000	1.0000	0.00
03	4/1/72	0000	1.0000	0.00
05	4/1/72	0000	1.0000	0.00
06	4/1/72	0000	1.0000	0.00
07	4/1/72	0000	1.0000	0.00
09	4/1/72	0000	1.0000	0.00
10	4/1/72	0000	1.0051	0.27
	10/1/72	0000	1.0019	0.41
11	4/1/72	0000	1.0010	0.26
	7/1/72	0000	1.0041	0.11
	9/1/72	0000	1.0010	0.26
13	4/1/72	0000	1.0013	0.74
	7/1/72	0000	1.0013	-0.26
14	4/1/72	0000	0.9993	-0.93
15	4/1/72	0000	1.0000	0.00
17	4/1/72	0000	1.0000	0.00
18	4/1/72	0000	0.9995	0.05
19	4/1/72	0000	0.9987	-0.07

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
21	4/1/72	0000	0.9980	1.29
	7/1/72	0000	0.9993	0.17
22	4/1/72	0000	0.9981	0.28
	7/1/72	0000	0.9994	-0.84
	10/1/72	0000	0.9981	0.28
23	4/1/72	0000	0.9976	0.83
	9/1/72	0000	0.9989	-0.29
	10/1/72	0000	0.9976	0.83
25	4/1/72	0000	1.0014	-0.83
26	4/1/72	0000	0.9978	0.81
27	4/1/72	0000	0.9983	0.27
29	4/1/72	0000	0.9995	-0.15
30	4/1/72	0000	0.9984	1.15
	7/1/72	0000	0.9996	0.04
	10/1/72	0000	0.9984	1.15
31	4/1/72	0000	0.9991	-0.02
33	4/1/72	0000	0.9984	0.16
34	4/1/72	0000	0.9978	0.12
	7/1/72	0000	0.9990	0.00
35	4/1/72	0000	0.9974	1.45
		Station 20		
01	4/1/72	0000	1.0044	-4.63
	7/1/72	0000	1.0076	-4.79
	10/1/72	0000	1.0044	-4.63
02	4/1/72	0000	1.0000	0.00
03	4/1/72	0000	1.0000	0.00
05	4/1/72	0000	1.0000	0.00
06	4/1/72	0000	1.0000	0.00
07	4/1/72	0000	1.0000	0.00
09	4/1/72	0000	1.0000	0.00
10	4/1/72	0000	1.0028	-2.14
	7/1/72	0000	1.0028	-1.13
	9/1/72	0000	1.0060	-1.28
	10/1/72	0000	0.9997	-0.99

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
11	4/1/72	0000	1.0016	0.03
	7/1/72	0000	1.0047	-0.12
	8/1/72	0000	1.0016	0.03
	10/1/72	0000	0.9984	0.17
13	4/1/72	0000	1.0057	-3.28
	10/1/72	0000	1.0025	-3.12
14	4/1/72	0000	1.0002	-1.12
	10/1/72	0000	1.0015	-1.25
15	4/1/72	0000	0.9982	-1.39
	7/1/72	0000	0.9994	-0.53
	9/1/72	0000	0.9982	0.60
	10/1/72	0000	0.9982	-0.39
17	4/1/72	0000	1.0000	0.00
18	4/1/72	0000	0.9997	0.72
	7/1/72	0000	0.9985	0.84
	9/1/72	0000	0.9975	-0.28
	10/1/72	0000	0.9985	0.84
19	4/1/72	0000	0.9994	-0.24
21	4/1/72	0000	1.0001	-0.01
	7/1/72	0000	0.9989	0.11
22	4/1/72	0000	0.9994	-0.24
23	4/1/72	0000	0.9990	0.10
25	4/1/72	0000	0.9989	0.81
	7/1/72	0000	1.0001	-0.31
26	4/1/72	0000	0.9981	0.58
	7/1/72	0000	0.9994	-0.54
	8/1/72	0000	0.9981	0.58
	10/1/72	0000	0.9994	0.46
27	4/1/72	0000	0.9994	-0.34
	8/1/72	0000	0.9981	0.78
	9/1/72	0000	1.0006	-0.46
29	4/1/72	0000	0.9995	0.05
	10/1/72	0000	1.0008	-0.07
30	4/1/72	0000	0.9983	0.87
	7/1/72	0000	0.9995	-0.25
	9/1/72	0000	0.9995	1.75
31	4/1/72	0000	0.9983	0.97
	7/1/72	0000	0.9995	-0.15
	9/1/72	0000	1.0008	-0.27

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
33	4/1/72	0000	0.9981	1.18
	7/1/72	0000	0.9994	0.06
	8/1/72	0000	0.9981	0.18
	9/1/72	0000	0.9981	1.18
	10/1/72	0000	0.9994	1.05
34	4/1/72	0000	1.0010	-0.50
	7/1/72	0000	0.9997	-0.38
	8/1/72	0000	1.0010	-0.50
35	4/1/72	0000	0.9989	0.21
	9/1/72	0000	1.0001	0.09
	Station 21			
01	4/1/72	0000	1.0032	-2.06
02	4/1/72	0000	1.0000	0.00
03	4/1/72	0000	1.0000	0.00
05	4/1/72	0000	1.0000	0.00
06	4/1/72	0000	1.0000	0.00
07	4/1/72	0000	1.0000	0.00
09	4/1/72	0000	1.0000	0.00
10	4/1/72	0000	1.0077	-1.77
11	4/1/72	0000	1.0057	-1.68
13	4/1/72	0000	1.0061	-1.59
14	4/1/72	0000	0.9991	-0.11
	9/1/72	0000	0.9991	-1.11
15	4/1/72	0000	1.0000	0.00
17	4/1/72	0000	1.0000	0.00
18	4/1/72	0000	0.9992	0.77
	7/1/72	0000	1.0005	-0.35
	9/1/72	0000	0.9992	0.77
	10/1/72	0000	1.0005	-0.35
19	4/1/72	0000	0.9993	0.37
21	4/1/72	0000	0.9998	0.82
22	4/1/72	0000	1.0015	-0.64
	8/1/72	0000	1.0003	-0.52
	9/1/72	0000	1.0015	-0.64
	10/1/72	0000	1.0003	-0.52

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
23	4/1/72	0000	1.0005	0.05
	7/1/72	0000	0.9993	0.17
	10/1/72	0000	1.0005	0.05
25	4/1/72	0000	0.9994	0.76
	7/1/72	0000	0.9994	-0.24
	8/1/72	0000	1.0006	-0.36
	9/1/72	0000	0.9994	-0.24
	10/1/72	0000	0.9994	0.76
26	4/1/72	0000	1.0000	0.00
27	4/1/72	0000	0.9996	0.34
29	4/1/72	0000	0.9976	2.12
	7/1/72	0000	0.9989	1.01
30	4/1/72	0000	1.0000	0.10
31	4/1/72	0000	0.9992	0.67
33	4/1/72	0000	1.0011	-0.21
34	4/1/72	0000	0.9999	0.31
	7/1/72	0000	0.9986	0.43
35	4/1/72	0000	0.9997	0.12
		Station 22		
01	4/1/72	0000	1.0072	-1.17
	10/30/72	1618	1.0108	-2.98
	2/11/73	1512	1.0096	-2.86
	2/16/73	1512	1.0083	-2.73
	2/20/73	0030	1.0205	-2.39
02	4/1/72	0000	1.0000	0.00
03	4/1/72	0000	1.0000	0.00
05	4/1/72	0000	1.0000	0.00
06	4/1/72	0000	1.0145	-0.41
	10/30/72	1612	1.0167	-0.30
	2/20/73	1630	1.0128	-5.59
07	4/1/72	0000	0.9890	0.53
	6/1/72	0000	0.9890	0.64
	8/1/72	0000	1.0075	0.31
	10/1/72	0000	0.9981	0.42
	1/10/73	0300	0.9712	0.75
	3/1/73	0000	0.9800	0.64
	3/15/73	2206	0.9712	0.75

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
09	4/1/72	0000	0.9942	1.78
	6/1/72	0000	0.9879	1.86
	8/1/72	0000	0.9816	1.94
	10/1/72	0000	0.9879	0.87
	11/1/72	0000	0.9755	2.02
	12/1/72	0000	0.9816	0.96
	1/1/73	0000	0.9694	1.13
	2/1/73	0000	0.9755	1.04
	2/20/73	1630	0.9948	-0.01
	3/1/73	0000	0.9885	0.11
10	4/1/72	0000	1.0013	-1.02
	6/1/72	0000	0.9949	-0.91
	7/7/72	1154	0.9823	0.30
	7/28/72	0000	0.9885	-0.79
	8/1/72	0000	0.9949	-0.91
	8/7/72	2018	0.9885	-0.79
	8/24/72	2036	1.0078	-1.14
	9/3/72	2024	0.9885	-0.79
	11/1/72	0000	0.9823	-0.68
	12/1/72	0000	0.9761	-0.57
	1/10/73	0300	0.9700	-0.46
	3/1/73	0000	0.9761	-0.57
11	4/1/72	0000	1.0000	0.00
		Station 23		
01	4/1/72	0000	1.0022	-5.15
	10/1/72	0000	1.0022	-4.14
	11/1/72	0000	1.0022	-5.15
02	4/1/72	0000	1.0035	-3.84
	10/1/72	0000	1.0060	-5.24
03	4/1/72	0000	1.0026	-2.34
05	4/1/72	0000	1.0036	-1.16
06	4/1/72	0000	1.0026	-1.63
07	4/1/72	0000	1.0002	-0.84
	8/1/72	0000	1.0027	-3.23
	10/1/72	0000	1.0002	-0.84
	11/1/72	0000	1.0027	-2.22
09	4/1/72	0000	1.0007	-0.82
	8/1/72	0000	1.0032	-3.22
	9/1/72	0000	1.0007	-0.82
	10/1/72	0000	1.0032	-2.22

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
10	4/1/72	0000	1.0065	-10.25
	10/1/72	0000	1.0040	-7.84
11	4/1/72	0000	1.0037	-2.30
13	4/1/72	0000	1.0025	-1.98
	10/1/72	0000	1.0025	-0.98
	11/1/72	0000	1.0050	-2.37
14	4/1/72	0000	1.0086	-0.38
15	4/1/72	0000	1.0095	-0.50
	10/1/72	0000	1.0095	0.51
17	4/1/72	0000	1.0236	-1.11
	8/1/72	0000	1.0306	-2.35
	10/1/72	0000	1.0236	-1.11
	11/1/72	0000	1.0168	0.11
18	4/1/72	0000	1.0181	-1.84
19	4/1/72	0000	1.0000	0.00
21	4/1/72	0000	1.0023	-1.72
22	4/1/72	0000	1.0004	-0.74
	8/1/72	0000	1.0016	-1.89
	9/1/72	0000	1.0004	-0.74
23	4/1/72	0000	1.0004	-0.44
25	4/1/72	0000	0.9985	1.24
26	4/1/72	0000	1.0000	0.00
	10/1/72	0000	0.9988	1.12
27	4/1/72	0000	0.9996	0.14
	10/1/72	0000	0.9984	0.26
29	4/1/72	0000	1.0008	0.53
30	4/1/72	0000	0.9997	0.02
31	4/1/72	0000	0.9999	-0.09
	10/1/72	0000	0.9986	1.03
33	4/1/72	0000	1.0003	-0.22
34	4/1/72	0000	0.9994	-0.14
35	4/1/72	0000	1.0001	-0.01
37	4/1/72	0000	0.9990	-0.10
	10/1/72	0000	0.9978	0.02
38	4/1/72	0000	1.0000	0.00
39	4/1/72	0000	1.0000	0.00

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
41	4/1/72	0000	1.0000	0.00
42	4/1/72	0000	0.9971	0.50
	Station 24			
01	4/1/72	0000	0.9998	0.34
	7/1/72	0000	1.0022	-1.06
	10/1/72	0000	0.9998	0.34
02	4/1/72	0000	1.0030	-2.56
	9/1/72	0000	1.0005	-1.18
03	4/1/72	0000	1.0104	-3.52
	8/1/72	0000	0.0129	-4.92
	9/1/72	0000	1.0104	-2.51
	10/1/72	0000	1.0129	-4.92
05	4/1/72	0000	1.0043	-0.96
	10/1/72	0000	1.0017	0.42
06	4/1/72	0000	1.0001	-0.91
	7/1/72	0000	1.0001	0.09
	9/1/72	0000	1.0001	-0.91
	10/1/72	0000	0.9989	-0.79
07	4/1/72	0000	1.0005	-2.45
	7/1/72	0000	1.0017	-2.58
	8/1/72	0000	1.0005	-2.45
09	4/1/72	0000	1.0000	0.00
10	4/1/72	0000	1.0000	0.00
11	4/1/72	0000	1.0000	0.00
13	4/1/72	0000	0.9998	-0.48
	7/1/72	0000	1.0010	-2.59
	9/1/72	0000	0.9998	-1.48
	10/1/72	0000	0.9998	0.52
14	4/1/72	0000	0.9915	1.47
	9/1/72	0000	1.0010	0.28
	10/1/72	0000	0.9915	1.47
15	4/1/72	0000	0.9916	0.08
	7/1/72	0000	1.0009	-0.12
	9/1/72	0000	0.9916	0.08
17	4/1/72	0000	1.0046	-0.54
18	4/1/72	0000	1.0026	0.42
19	4/1/72	0000	1.0000	6.00

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
21	4/1/72	0000	1.0001	0.89
	9/1/72	0000	0.9989	2.01
	10/1/72	0000	0.9989	1.01
22	4/1/72	0000	0.9984	1.45
	10/1/72	0000	0.9971	1.57
23	4/1/72	0000	0.9991	1.08
		Station 25		
01	4/1/72	0000	1.0110	-4.82
	5/24/72	0000	1.0047	-4.18
	6/1/72	0000	1.0047	-3.17
	6/4/72	1842	1.0059	-3.29
	6/9/72	1612	1.0072	-3.43
	6/15/72	2036	1.0084	-3.54
	6/22/72	1518	1.0097	-3.68
	7/1/72	0000	1.0097	-4.69
	8/1/72	0000	1.0097	-3.68
	9/15/72	1054	1.0084	-3.55
	9/24/72	0036	1.0072	-3.43
	10/22/72	0430	1.0084	-3.55
	11/29/72	1654	1.0097	-3.68
	1/4/73	1506	1.0009	-3.80
	1/31/73	1818	1.0084	-4.55
	3/12/73	1118	1.0072	-4.43
02	4/1/72	0000	1.0000	0.00
03	4/1/72	0000	1.0000	0.00
05	4/1/72	0000	1.0000	0.00
06	4/1/72	0000	1.0168	-4.36
	5/24/72	0000	1.0142	-4.08
	6/7/72	1512	1.0155	-4.29
	8/24/72	1418	1.0155	-5.23
	9/15/72	1054	1.0142	-6.11
	9/24/72	0036	1.0142	-7.12
	11/1/72	0000	1.0155	-7.22
	11/29/72	1654	1.0168	-12.37
	1/4/73	1506	1.0129	-12.04
	1/12/73	2330	1.0142	-13.21
	1/20/73	1124	1.0142	-14.22
	1/31/73	1818	1.0129	-4.95
	2/20/73	1906	1.0142	-5.09
	3/2/73	0000	1.0129	-4.95
	3/7/73	1636	1.0117	-4.81
	3/21/73	1812	1.0104	-4.67

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
07	4/1/72	0000	1.0725	-5.32
	7/7/72	1848	1.0621	0.14
	8/15/72	1348	0.9856	-1.14
	1/4/73	1506	0.9768	0.91
	1/14/73	1530	0.9856	-3.11
	1/31/73	1818	0.9856	-4.10
09	4/1/72	0000	1.0052	-1.28
	5/24/72	0000	1.0118	-0.38
	7/7/72	1848	1.0052	6.76
	8/15/72	1348	0.9923	-5.05
	9/1/72	0000	0.9860	-3.93
	10/1/72	0000	0.9923	-2.07
	10/22/72	0430	0.9923	-4.05
	11/29/72	1654	0.9987	-3.18
	1/4/73	1506	0.9860	1.98
	1/14/73	1530	0.9797	-0.88
	1/20/73	0124	0.9860	-2.95
	1/31/73	1818	0.9860	-0.96
10	4/1/72	0000	1.0033	1.54
	6/1/72	0000	1.0099	1.43
	7/7/72	1848	0.9968	8.63
	8/15/72	1348	0.9777	-1.93
	10/1/72	0000	0.9715	3.06
	10/22/72	0430	0.9715	-2.77
	11/1/72	0000	0.9654	-1.67
	12/1/72	0000	0.9715	-0.83
	1/4/73	1506	1.0019	2.88
	1/14/73	1530	0.9956	-0.04
	2/1/73	0000	1.0019	-1.13
	3/1/73	0000	1.0019	-2.12
11	4/1/72	0000	1.0085	-9.65
	1/4/73	1506	1.0000	0.00
		Station 26		
01	4/1/72	0000	1.0073	-3.86
	7/1/72	0000	1.0047	-1.45
	8/1/72	0000	1.0047	-2.43
02	4/1/72	0000	1.0105	-4.87
	6/1/72	0000	1.0080	-3.46
	7/1/72	0000	1.0055	-2.06
	8/1/72	0000	1.0080	-3.46
03	4/1/72	0000	1.0037	-2.97
	7/1/72	0000	1.0012	-0.59
	9/1/72	0000	1.0037	-1.97

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
05	4/1/72	0000	1.0032	-4.62
	7/1/72	0000	1.0007	-3.22
	10/1/72	0000	1.0032	0.40
06	4/1/72	0000	1.0032	-1.40
	6/1/72	0000	1.0007	0.99
	7/1/72	0000	1.0007	-0.02
	9/1/72	0000	0.9983	2.36
	10/1/72	0000	1.0007	0.99
07	4/1/72	0000	1.0010	-0.96
	6/1/72	0000	1.0035	-2.35
	7/1/72	0000	1.0010	-0.96
	10/1/72	0000	1.0010	0.05
09	4/1/72	0000	1.0069	-4.19
	6/1/72	0000	1.0045	-2.80
10	4/1/72	0000	1.0002	-0.74
	8/1/72	0000	1.0027	-2.13
	9/1/72	0000	1.0002	-1.74
	10/1/72	0000	1.0027	-3.13
11	4/1/72	0000	1.0015	-0.53
	9/1/72	0000	0.9990	0.85
	10/1/72	0000	1.0015	-0.53
13	4/1/72	0000	1.0035	-1.34
	6/1/72	0000	1.0035	-0.34
	7/1/72	0000	1.0060	-2.74
	8/1/72	0000	1.0035	-0.34
	9/1/72	0000	1.0035	-1.34
14	4/1/72	0000	1.0057	-0.21
	6/1/72	0000	1.0057	0.79
	7/12/72	1348	1.0152	-0.40
	7/30/72	1254	1.0152	-3.45
	8/7/72	1518	1.0152	-6.50
	8/12/72	0406	1.0152	-5.48
	8/14/72	0512	1.0152	-3.45
	8/21/72	0536	1.0152	-2.44
	8/23/72	0548	1.0152	-1.42
	8/31/72	0924	1.0057	-0.21
15	4/1/72	0000	1.0066	-0.33
	5/16/72	1242	1.0066	-1.34
	5/25/72	0230	1.0066	-0.33
17	4/1/72	0000	1.0046	-0.53
18	4/1/72	0000	1.0146	-1.44
	7/1/72	0000	1.0079	-0.23

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
	9/1/72	0000	1.0146	-1.44
	9/28/72	0542	1.0146	-2.45
19	4/1/72	0000	1.0000	0.00
21	4/1/72	0000	0.9988	1.22
	6/1/72	0000	1.0000	0.10
	7/1/72	0000	1.0013	-0.02
	8/1/72	0000	1.0000	0.10
22	4/1/72	0000	0.9991	0.68
	7/1/72	0000	1.0003	0.56
	8/1/72	0000	0.9991	0.68
	9/1/72	0000	0.9979	0.80
23	4/1/72	0000	0.9996	0.74
	6/1/72	0000	1.0009	0.62
	9/1/72	0000	0.9996	0.74
25	4/1/72	0000	0.9986	1.23
	7/1/72	0000	0.9999	1.11
	8/1/72	0000	0.9986	1.23
	10/1/72	0000	0.9974	1.35
26	4/1/72	0000	0.9991	0.98
	7/1/72	0000	1.0004	0.86
	8/1/72	0000	0.9991	0.98
	10/1/72	0000	0.9979	1.10
27	4/1/72	0000	0.9983	1.07
	7/1/72	0000	0.9995	0.95
	9/1/72	0000	0.9983	1.07
29	4/1/72	0000	0.9986	0.63
	6/1/72	0000	0.9974	1.75
	7/1/72	0000	0.9986	1.63
	8/1/72	0000	0.9974	1.75
30	4/1/72	0000	0.9989	0.71
	6/1/72	0000	0.9976	1.82
	7/1/72	0000	0.9964	2.94
	8/1/72	0000	0.9976	1.82
	9/1/72	0000	0.9964	1.94
31	4/1/72	0000	0.9985	0.84
	6/1/72	0000	0.9997	0.72
	7/1/72	0000	0.9985	0.84
	8/1/72	0000	0.9997	0.72
	9/1/72	0000	0.9973	1.96
	10/1/72	0000	0.9985	0.84
33	4/1/72	0000	0.9986	0.93

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
	7/1/72	0000	0.9999	0.81
	9/1/72	0000	0.9986	0.93
34	4/1/72	0000	0.9989	0.72
	6/1/72	0000	0.9975	1.83
	7/1/72	0000	0.9989	1.72
	8/1/72	0000	0.9975	1.83
	10/1/72	0000	0.9963	1.95
35	4/1/72	0000	0.9983	0.87
	7/1/72	0000	0.9983	1.86
	8/1/72	0000	0.9999	0.75
	9/1/72	0000	0.9983	0.87
37	4/1/72	0000	0.9979	0.21
	6/1/72	0000	0.9991	0.86
	8/1/72	0000	0.9991	0.91
	9/1/72	0000	0.9979	0.79
38	4/1/72	0000	1.0002	0.18
	6/12/72	1824	0.9996	0.37
39	4/1/72	0000	1.0002	-0.18
	6/12/72	1824	0.9996	0.37
41	4/1/72	0000	1.0002	-0.18
	6/12/72	1824	0.9996	0.37
42	4/1/72	0000	0.9978	1.46
	7/20/72	1906	0.9968	-1.18
	9/1/72	0000	0.9968	-2.18
	10/1/72	0000	0.9956	-3.05
		Station 27		
01	4/1/72	0000	1.0010	-1.45
	8/1/72	0000	1.0035	-3.85
	10/1/72	0000	1.0060	-5.25
02	4/1/72	0000	1.0040	-3.22
	8/1/72	0000	1.0015	-1.83
	10/1/72	0000	1.0040	-3.22
03	4/1/72	0000	1.0030	-3.06
	8/1/72	0000	1.0005	-1.68
	10/1/72	0000	1.0030	-3.06
05	4/1/72	0000	1.0035	-2.74
	10/1/72	0000	1.0035	-3.74
	11/1/72	0000	1.0060	-5.14
06	4/1/72	0000	0.9999	-0.79

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
	9/1/72	0000	0.9986	-0.67
	11/1/72	0000	0.9974	-0.55
07	4/1/72	0000	1.0006	-1.36
	7/1/72	0000	0.9994	-1.24
	10/1/72	0000	0.9981	-1.11
09	4/1/72	0000	1.0000	0.00
10	4/1/72	0000	1.0000	0.00
11	4/1/72	0000	1.0000	0.00
13	4/1/72	0000	0.9991	-0.01
	10/1/72	0000	0.9979	1.10
	11/1/72	0000	0.9991	-0.01
14	4/1/72	0000	1.0057	-0.11
	7/24/72	1524	1.0057	-1.12
	10/1/72	0000	0.9962	0.08
	11/1/72	0000	1.0057	-1.12
15	4/1/72	0000	1.0095	-0.30
	6/26/72	0842	1.0095	0.71
	7/1/72	0000	1.0000	1.90
	7/24/72	1524	1.0000	0.90
	9/1/72	0000	1.0000	1.90
17	4/1/72	0000	1.0007	0.98
	6/15/72	0318	1.0007	1.98
	6/19/72	0654	1.0073	2.81
	7/5/72	2154	1.0073	1.80
	7/12/72	0348	1.0007	0.98
	7/18/72	0912	1.0007	-0.02
	7/25/72	0230	1.0007	-1.02
18	4/1/72	0000	1.0080	-0.84
	7/24/72	1524	1.0080	2.18
	8/18/72	2324	1.0080	1.18
	9/1/72	0000	1.0013	0.36
19	4/1/72	0000	1.0000	0.00
21	4/1/72	0000	1.0003	-0.72
	7/1/72	0000	0.9990	-0.60
	11/1/72	0000	0.9978	-0.48
22	4/1/72	0000	0.9983	-0.33
	10/1/72	0000	0.9970	-0.21
23	4/1/72	0000	0.9999	-0.19
	7/1/72	0000	0.9999	-1.19
	11/1/72	0000	0.9974	0.05

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
		Station 28		
01	4/1/72	0000	1.0078	-2.08
02	4/1/72	0000	1.0000	0.00
03	4/1/72	0000	1.0000	0.00
05	4/1/72	0000	1.0000	0.00
06	4/1/72	0000	1.0157	-4.35
07	4/1/72	0000	1.0217	-0.53
	6/1/72	0000	1.0028	0.76
	7/1/72	0000	1.0121	-0.38
	8/1/72	0000	1.0028	-0.24
	9/1/72	0000	1.0217	-0.53
	11/1/72	0000	1.0314	-0.67
09	4/1/72	0000	1.0059	0.78
	6/1/72	0000	1.0126	0.64
	7/1/72	0000	1.0193	-0.53
	8/1/72	0000	1.0126	-0.38
	11/1/72	0000	1.0059	0.78
	12/1/72	0000	1.0059	-0.23
	1/1/73	0000	0.9993	0.91
	3/2/73	0000	1.0059	-0.23
10	4/1/72	0000	1.0105	-0.61
	6/1/72	0000	1.0105	0.40
	7/1/72	0000	1.0172	-0.74
	9/1/72	0000	1.0105	-0.61
	2/1/73	0000	1.0039	-0.48
	3/2/73	0000	1.0105	-0.61
11	4/1/72	0000	1.0000	0.00
		Station 29		
01	4/1/72	0000	1.0047	-1.76
	5/13/72	1824	1.0034	-2.64
	6/1/72	0000	1.0022	-2.52
	6/16/72	0000	0.9996	-3.27
	7/1/72	0000	0.9960	-2.89
	7/21/72	1336	1.0059	-2.89
	1/1/73	0000	1.0059	-1.88
	3/2/73	0000	1.0059	-2.89
02	4/1/72	0000	0.9993	0.07
	12/7/72	2054	0.9989	0.19

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
03	4/1/72	0000	0.9993	0.07
	12/7/72	2054	0.9989	0.19
05	4/1/72	0000	0.9993	0.07
	12/7/72	2054	0.9989	0.19
06	4/1/72	0000	1.0114	-3.87
	5/13/72	1824	1.0064	-2.31
	6/1/72	0000	1.0051	-2.18
	6/14/72	0748	1.0026	-2.91
	7/1/72	0000	1.0013	-2.77
	7/10/72	0242	0.9964	-1.23
	7/21/72	1336	1.0088	-2.58
	8/1/72	0000	1.0101	-3.73
	9/1/72	0000	1.0088	-2.58
	11/1/72	0000	1.0076	-2.45
	12/1/72	0000	1.0088	-2.58
	12/7/72	2054	1.0101	-2.72
	12/18/72	0930	1.0088	-2.58
	1/18/73	1636	1.0127	-4.01
	3/2/73	0000	1.0101	-3.73
07	4/1/72	0000	1.0083	-0.52
	6/7/72	1542	1.0083	-6.57
	7/1/72	0000	0.9991	-6.27
	9/14/72	1654	0.9229	0.78
	10/1/72	0000	0.9151	0.99
	11/1/72	0000	0.9229	1.71
	12/1/72	0000	0.9229	-0.14
	12/7/72	2054	1.0083	-0.52
	1/9/73	1636	0.9991	0.72
09	4/1/72	0000	0.9981	0.37
	6/7/72	1542	0.9917	0.60
	7/1/72	0000	0.9854	0.83
	7/21/72	1336	0.9854	1.81
	9/1/72	0000	0.9917	0.60
	12/1/72	0000	0.9854	-1.14
	12/7/72	2054	0.9854	1.81
	1/1/73	0000	0.9917	0.60
10	4/1/72	0000	0.9942	-0.39
	6/7/72	1542	0.9878	0.84
	7/1/72	0000	0.9878	-0.15
	7/21/72	1336	0.9942	-0.39
	9/1/72	0000	0.9878	-0.15
	10/1/72	0000	0.9815	0.08
	11/1/72	0000	0.9815	-0.90
	12/1/72	0000	0.9692	-0.43
	12/7/72	2054	1.0006	-1.62

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
	1/1/73	0000	0.9942	-0.39
	2/1/73	0000	0.9878	0.84
	3/2/73	0000	0.9878	-0.15
11	4/1/72	0000	1.0000	0.00
		Station 30		
01	4/1/72	0000	0.9986	-0.57
	3/2/73	0000	0.9974	-0.44
02	4/1/72	0000	0.9992	0.38
03	4/1/72	0000	0.9992	0.38
05	4/1/72	0000	1.0004	-0.04
	10/1/72	0000	0.9991	1.09
	11/1/72	0000	1.0004	-0.04
	12/1/72	0000	0.9991	0.09
	3/2/73	0000	0.9979	0.22
06	4/1/72	0000	0.9992	0.38
07	4/1/72	0000	1.0009	-1.99
	10/1/72	0000	0.9996	-1.86
	12/1/72	0000	0.9996	-0.86
	1/1/73	0000	1.0009	-1.99
	2/1/73	0000	0.9996	-1.86
09	4/1/72	0000	0.9992	0.38
10	4/1/72	0000	0.9992	0.38
11	4/1/72	0000	0.9992	0.38
13	4/1/72	0000	0.9966	2.03
	10/1/72	0000	0.9978	1.91
	12/1/72	0000	0.9966	1.03
14	4/1/72	0000	0.9925	0.65
	11/1/72	0000	1.0019	0.46
	12/1/72	0000	0.9925	0.65
	3/2/73	0000	1.0019	-0.54
15	4/1/72	0000	0.9953	0.49
	2/1/73	0000	1.0047	-0.70
	3/2/73	0000	0.9953	0.49
17	4/1/72	0000	1.0020	1.85
	11/1/72	0000	1.0020	2.85
	12/1/72	0000	1.0020	0.85
	2/1/73	0000	1.0020	1.85

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
18	4/1/72	0000	1.0033	0.51
	11/1/72	0000	1.0033	1.51
	12/1/72	0000	1.0033	0.51
	1/1/73	0000	0.9967	0.69
	2/1/73	0000	1.0033	-0.50
19	4/1/72	0000	1.0000	0.00
21	4/1/72	0000	0.9993	0.25
22	4/1/72	0000	0.9991	0.68
		Station 31		
01	4/1/72	0000	1.0109	-2.29
	6/1/72	0000	1.0135	-2.55
	9/25/72	1936	1.0099	-5.31
	10/1/72	0000	1.0112	-4.43
	10/13/72	0000	1.0137	-4.69
	12/1/72	1548	1.0099	-4.30
02	4/1/72	0000	1.0000	0.00
03	4/1/72	0000	1.0000	0.00
05	4/1/72	0000	1.0000	0.00
06	4/1/72	0000	1.0135	-6.33
	9/25/72	1936	1.0197	-5.25
07	4/1/72	0000	0.9864	-0.38
	6/1/72	0000	0.9864	-1.37
	9/1/72	0000	0.9954	0.47
	1/1/73	0000	0.9864	0.60
	1/22/73	1948	0.9954	-0.53
	3/2/73	0000	1.0046	-2.68
09	4/1/72	0000	0.9910	0.48
	6/1/72	0000	0.9974	-0.65
	7/1/72	0000	0.9910	0.48
	9/25/72	1936	1.0032	-2.37
	10/1/72	0000	0.9968	-0.23
	10/13/72	0000	0.9968	0.76
	11/1/72	0000	1.0032	0.64
	12/1/72	1536	0.9968	2.76
	1/1/73	0000	1.0097	1.52
	1/22/73	1948	0.9968	-2.23
	3/2/73	0000	0.9968	-4.22

Internal Calibration Values

Sensor position No.	Starting date	Time (GMT)	Slope (α)	Intercept (β)
10	4/1/72	0000	1.0039	-1.29
	6/1/72	0000	0.9974	-1.14
	9/25/72	1936	0.9936	-0.56
	10/1/72	0000	1.0000	-0.70
	11/1/72	0000	0.9936	-0.56
	12/1/72	1536	1.0000	-0.70
	1/1/73	0000	0.9936	-0.56
	1/22/73	1948	1.0000	-1.70
	3/2/73	0000	0.9936	-1.55
11	4/1/72	0000	1.0000	0.00

APPENDIX V

Sensor Calibration Correction Values

APPENDIX V

Sensor Calibration Correction Values

Calibration correction values for air temperature (°C)

$S_1 = 0.0650 \quad S_0 = 25.00$

Sensor No.	Starting date	-30.00	-25.00	-20.00	-15.00	-10.00	-5.00	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00
1001	4/1/72	0.11	-0.17	-0.19	-0.09	0.02	0.08	0.01	-0.01	-0.10	-0.16	-0.17	-0.09	0.00	0.10	0.16	0.12
1002	4/1/72	0.05	-0.22	-0.24	-0.14	-0.03	0.02	-0.02	-0.08	-0.16	-0.21	-0.22	-0.15	-0.06	0.04	0.11	0.06
	11/15/72	0.06	-0.22	-0.24	-0.14	-0.02	0.03	-0.02	-0.08	-0.15	-0.21	-0.21	-0.14	-0.05	0.04	0.11	0.07
1003	4/1/72	0.03	-0.25	-0.27	-0.17	-0.06	0.00	-0.04	-0.10	-0.18	-0.23	-0.22	-0.19	-0.09	0.00	0.06	0.02
1005	4/1/72	0.27	-0.01	-0.03	0.06	0.17	0.23	0.08	0.37	0.12	0.00	0.01	0.06	0.16	0.19	0.23	0.22
1006	4/1/72	0.10	-0.18	-0.02	-0.10	0.00	0.06	0.01	-0.03	-0.12	-0.17	-0.17	-0.10	-0.01	0.08	0.14	0.10
1007	4/1/72	0.12	-0.16	-0.18	-0.08	0.03	0.09	-0.01	-0.05	-0.12	-0.18	-0.14	-0.02	0.01	0.13	0.19	0.15
	11/15/72	0.11	-0.16	-0.18	-0.09	0.02	0.08	0.01	-0.04	-0.11	-0.16	-0.15	-0.08	0.00	0.11	0.17	0.12
1008	4/1/72	0.09	-0.18	-0.20	-0.11	0.00	0.06	0.01	-0.03	-0.11	-0.16	-0.17	-0.10	-0.01	0.07	0.13	0.08
1009	4/1/72	0.12	-0.16	-0.17	-0.08	0.03	0.09	0.05	0.00	-0.08	-0.13	-0.14	-0.06	0.01	0.10	0.15	0.10
1010	4/1/72	0.10	-0.17	-0.19	-0.10	0.01	0.07	-0.03	-0.08	-0.14	-0.18	-0.16	-0.11	0.00	0.11	0.18	0.15
1011	4/1/72	0.11	-0.16	-0.18	-0.08	0.02	0.08	0.05	0.00	-0.08	-0.13	-0.14	-0.10	0.00	0.09	0.14	0.09
1012	4/1/72	0.10	-0.18	-0.20	-0.10	0.01	0.06	0.07	-0.05	-0.13	-0.17	-0.15	-0.10	-0.01	0.07	0.14	0.10
	9/26/72	0.12	-0.16	-0.18	-0.08	0.02	0.08	0.01	-0.04	-0.11	-0.15	-0.14	-0.10	0.00	0.09	0.15	0.22
1013	4/1/72	0.25	-0.03	-0.05	0.04	0.16	0.21	0.16	0.07	0.01	-0.01	0.00	0.06	0.15	0.24	0.30	0.25
1014	4/1/72	0.11	-0.16	-0.18	-0.08	0.02	0.08	-0.01	-0.05	-0.12	-0.16	-0.15	-0.08	0.01	0.12	0.18	0.14
1015	4/1/72	0.03	-0.25	-0.27	-0.17	-0.05	0.00	-0.08	-0.14	-0.23	-0.29	-0.28	-0.21	-0.12	0.00	0.42	0.02
1016	4/1/72	0.10	-0.17	-0.19	-0.09	0.01	0.07	0.05	0.00	-0.00	-0.15	-0.15	-0.08	0.00	0.07	0.14	0.07
	10/16/72	0.13	-0.15	-0.17	-0.07	0.03	0.09	0.05	0.00	-0.05	-0.11	-0.13	-0.06	0.00	0.09	0.16	0.11
1017	4/1/72	0.14	-0.14	-0.16	-0.06	0.04	0.10	0.03	0.00	-0.08	-0.13	-0.13	-0.06	0.03	0.13	0.19	0.14
	11/15/72	0.14	-0.14	-0.16	-0.06	0.05	0.10	0.03	0.00	-0.06	-0.14	-0.13	-0.05	0.04	0.13	0.19	0.15
1018	4/1/72	0.15	-0.13	-0.14	-0.05	0.06	0.12	0.09	0.03	-0.03	-0.09	-0.09	-0.06	0.03	0.13	0.17	0.12
1019	4/1/72	0.19	-0.08	-0.10	-0.01	0.10	0.16	0.09	0.04	-0.02	-0.07	-0.05	-0.02	0.07	0.18	0.24	0.20
1020	4/1/72	0.11	-0.17	-0.19	-0.09	0.01	0.07	0.05	0.00	-0.08	-0.14	-0.14	-0.10	-0.01	0.07	0.13	0.08
	12/10/72	0.11	-0.17	-0.19	-0.09	0.02	0.08	0.05	-0.01	-0.08	-0.14	-0.15	-0.09	0.00	0.09	0.14	0.09
1021	4/1/72	0.11	-0.17	-0.19	-0.09	0.01	0.07	0.08	-0.02	-0.10	-0.15	-0.15	-0.08	-0.01	0.07	0.13	0.10
	10/16/72	0.11	-0.16	-0.18	-0.08	0.02	0.08	0.03	-0.02	-0.09	-0.14	-0.15	-0.08	0.01	0.10	0.15	0.10
	11/15/72	0.13	-0.15	-0.17	-0.07	0.03	0.09	0.03	-0.01	-0.08	-0.14	-0.14	-0.07	0.01	0.11	0.17	0.12
1022	4/1/72	0.00	-0.28	-0.30	-0.20	-0.09	-0.03	-0.03	-0.14	-0.21	-0.27	-0.28	-0.22	-0.13	-0.03	0.03	0.00
	9/13/72	0.01	-0.27	-0.29	-0.19	-0.07	-0.02	-0.02	-0.13	-0.20	-0.26	-0.27	-0.20	-0.11	-0.01	0.05	0.02

Calibration correction values for atmospheric pressure

$S_1 = 0.1389 \quad S_0 = 5.56$

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
	Sensor No. 2001		
Starting date: 4/1/72		Starting date: 10/12/72	
-2.26	2.16	-1.63	1.44
3.27	2.19	4.19	1.36
8.64	2.34	9.72	1.28
14.25	2.30	15.34	1.20
19.70	2.38	21.08	0.97
25.24	2.40	26.74	0.87
30.82	2.37	32.60	0.60
36.52	2.20	38.42	0.34
42.21	2.08	44.26	0.10
47.71	2.12	49.91	0.03
53.35	2.07	55.76	-0.13
59.37	1.58	61.27	-0.22
64.21	2.27	67.13	-0.51
70.03	2.00	72.74	-0.68
75.75	1.86	78.59	-0.91
81.47	1.67	84.32	-1.21
	Sensor No. 2002		
Starting date: 4/1/72		Starting date: 8/22/72	
6.43	-6.53	1.47	-4.05
11.17	-5.70	7.15	-4.04
15.98	-4.99	12.97	-3.71
20.77	-4.21	18.63	-3.31
25.52	-3.43	24.05	-2.82
30.55	-2.90	29.41	-2.39
35.61	-2.41	35.21	-2.23
40.57	-1.84	40.84	-1.97
45.88	-1.58	46.23	-1.73
50.86	-1.02	51.56	-1.34
55.97	-0.54	57.02	-1.00
60.90	0.05	62.76	-0.79
66.01	0.47	68.16	-0.49
71.05	0.98	73.43	-0.04
75.99	1.62	78.98	0.26
81.07	2.07	84.47	0.62

Calibration correction values for atmospheric pressure (Continued)

$S_1 = 0.1389 \quad S_0 = 5.56$

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
	Sensor No. 2003		
Starting date: 4/1/72		Starting date: 2/5/73	
7.76	-7.86	-0.01	-0.12
13.27	-7.80	5.59	-0.12
18.60	-7.61	10.95	-0.01
24.43	-7.87	16.47	0.08
29.82	-7.73	22.03	0.10
35.33	-7.68	27.49	0.15
40.98	-7.78	33.12	0.09
46.52	-7.79	38.62	0.13
52.36	-8.06	44.23	0.10
57.92	-8.08	49.80	0.07
63.42	-7.99	55.47	0.00
68.61	-7.65	60.99	0.00
74.13	-7.64	66.53	-0.01
79.53	-7.49	71.98	0.11
85.05	-7.43	77.36	0.32
90.46	-7.31	82.65	0.51
Starting date: 2/24/73		Starting date: 3/16/73	
-0.10	-0.08	-0.28	0.09
5.41	-0.03	5.33	0.09
10.78	0.07	10.78	0.20
16.31	0.15	16.31	0.24
21.77	0.22	21.82	0.29
27.31	0.24	27.36	0.30
32.91	0.19	32.91	0.28
38.42	0.23	38.40	0.31
44.07	0.18	44.04	0.24
49.67	0.13	49.58	0.20
55.39	0.03	55.20	0.13
60.82	0.08	60.72	0.18
66.35	0.08	66.35	0.13
71.75	0.22	71.77	0.27
77.17	0.42	77.24	0.41
82.48	0.59	82.47	0.66

Calibration correction values for atmospheric pressure (Continued)

$S_1 = 0.1389 \quad S_0 = 5.56$

Sensor No. 2004

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
Starting date: 4/1/72		Starting date: 8/16/72	
5.06	-5.16	3.36	-4.31
9.80	-4.33	8.46	-3.78
14.82	-3.83	13.62	-3.29
20.13	-3.57	18.56	-2.82
24.89	-2.80	23.63	-2.27
30.17	-2.52	28.76	-1.85
35.13	-1.93	33.81	-1.35
40.21	-1.48	38.85	-0.86
45.32	-1.02	43.97	-0.41
50.21	-0.37	48.84	0.21
55.48	-0.05	53.99	0.64
60.39	0.56	58.88	1.22
65.30	1.18	63.88	1.80
70.46	1.57	69.46	2.03
75.55	2.06	74.14	2.69
80.69	2.45	79.22	3.13
Starting date: 12/6/72		Starting date: 2/16/73	
-1.04	-1.26	-1.24	1.04
4.60	-1.24	4.44	0.94
10.29	-1.08	9.96	0.86
15.83	-0.81	15.71	0.78
21.48	-0.56	21.30	0.69
27.18	-0.39	26.99	0.56
32.95	-0.22	32.67	0.39
38.52	0.02	38.31	0.31
44.18	0.23	43.98	0.21
49.74	0.58	49.48	0.22
55.42	0.81	55.21	0.11
60.89	1.17	60.75	0.13
66.38	1.35	66.26	0.16
72.19	1.47	71.99	-0.04
77.77	1.81	77.62	-0.07
83.34	2.04	83.13	-0.09

Calibration correction values for atmospheric pressure (Continued)

$S_1 = 0.1389 \quad S_0 = 5.56$

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
Sensor No. 2004 (Continued)		Sensor No. 2005	
Starting date: 3/22/73		Starting date: 4/1/72	
-1.44	1.24	-0.13	0.03
4.06	1.21	5.61	-0.14
9.50	1.25	11.38	-0.39
15.27	1.07	17.36	-0.80
20.88	0.99	23.29	-1.20
26.78	0.76	29.25	-1.60
32.43	0.64	35.31	-2.11
38.13	0.50	41.31	-2.58
43.62	0.50	47.45	-3.15
49.26	0.46	53.76	-3.92
54.83	0.41	59.36	-3.93
60.40	0.38	64.27	-3.31
66.02	0.34	69.17	-2.68
71.63	0.23	74.19	-2.15
77.16	0.22	79.17	-1.55
82.74	0.21	84.21	-1.06

Sensor No. 2005 (Continued)

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
Starting date: 8/16/72		Starting date: 10/11/72	
-0.13	-0.10	0.14	-0.34
5.61	-0.32	5.99	-0.72
11.38	-0.65	11.93	-1.06
17.36	-0.96	17.69	-1.38
23.29	-1.38	23.69	-1.82
29.25	-1.80	29.67	-2.26
35.31	-2.22	35.54	-2.64
41.31	-2.87	41.97	-3.37
47.45	-3.46	48.13	-3.82
53.76	-4.12	54.19	-4.31
59.36	-4.11	59.72	-4.26
64.27	-3.54	64.69	-3.68
69.17	-2.99	69.73	-3.22
74.19	-2.44	74.70	-2.62
79.17	-1.84	79.70	-1.98
84.21	-1.32	84.68	-1.58

Calibration correction values for atmospheric pressure (Continued)

$S_1 = 0.1389 \quad S_0 = 5.56$

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
Sensor No. 2006		Sensor No. 2007	
Starting date: 4/1/72		Starting date: 4/1/72	
-0.53	0.43	0.26	-0.36
4.96	0.50	5.74	-0.27
10.28	0.70	11.56	-0.57
16.02	0.53	16.89	-0.33
21.41	0.67	22.38	-0.29
27.00	0.64	28.08	-0.43
32.11	1.08	33.50	-0.30
38.16	0.56	38.89	-0.16
43.80	0.49	44.73	-0.43
49.28	0.55	50.28	-0.44
55.15	0.27	56.07	-0.64
60.66	0.29	61.48	-0.52
66.09	0.39	67.12	-0.63
71.55	0.48	72.62	-0.58
77.09	0.52	78.03	-0.41
82.68	0.46	83.37	-0.22

Sensor No. 2007 (Continued)

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
Starting date: 8/24/72		Starting date: 11/18/72	
0.26	-4.20	0.38	-4.26
5.74	-4.16	5.87	-4.22
11.56	-4.04	11.42	-3.99
16.89	-3.49	17.00	-3.53
22.38	-3.03	22.49	-3.08
28.08	-2.73	28.19	-2.77
33.50	-2.30	33.82	-2.43
38.89	-1.84	39.48	-2.11
44.73	-1.66	45.13	-1.84
50.28	-1.37	50.73	-1.58
56.07	-1.25	56.57	-1.49
61.48	-1.01	62.02	-1.26
67.12	-0.72	67.45	-0.86
72.62	-0.32	73.06	-0.50
78.03	0.22	78.49	0.03
83.37	0.78	83.89	0.57

Calibration correction values for atmospheric pressure (Continued)

$S_1 = 0.1389 \quad S_0 = 5.56$

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
Sensor No. 2007 (Continued)		Sensor No. 2008	
Starting date: 2/7/73		Starting date: 4/1/72	
-0.09	-0.24	3.10	-3.20
5.49	-0.21	8.71	-3.24
11.06	-0.25	14.30	-3.31
16.57	-0.22	20.06	-3.50
22.12	-0.21	25.74	-3.65
27.54	-0.21	30.38	-2.73
33.37	-0.39	37.02	-3.82
38.94	-0.48	42.76	-4.03
44.71	-0.62	48.40	-4.10
50.37	-0.71	53.99	-4.15
56.20	-0.95	59.60	-4.17
61.79	-0.95	65.19	-4.23
67.38	-0.92	70.75	-4.26
72.72	-0.85	76.37	-4.33
78.07	-0.67	81.90	-4.28
83.37	-0.49	87.11	-3.96
Sensor No. 2008 (Continued)			
Starting date: 8/26/72		Starting date: 11/18/72	
3.10	-3.29	3.29	-3.41
8.71	-3.37	8.99	-3.52
14.30	-3.39	14.46	-3.61
20.06	-3.54	20.14	-3.72
25.74	-3.73	25.91	-3.99
30.38	-3.30	31.53	-4.13
37.02	-3.90	37.18	-4.30
42.76	-4.08	42.86	-4.39
48.40	-4.22	48.66	-4.66
53.99	-4.29	54.27	-4.73
59.60	-4.33	59.94	-4.77
65.19	-4.41	65.56	-4.55
70.75	-4.51	71.27	-4.69
76.37	-4.45	76.60	-4.56
81.90	-4.40	82.14	-4.63
87.11	-4.32	87.86	-4.73

Calibration correction values for atmospheric pressure (Continued)

$S_1 = 0.1389 \quad S_0 = 5.56$

Sensor No. 2008 (Continued)

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
Starting date: 2/7/73		Starting date: 3/16/73	
3.32	-3.42	3.29	-3.40
9.11	-3.58	8.94	-3.55
14.74	-3.75	14.68	-3.72
20.58	-3.94	20.34	-3.89
26.36	-4.23	26.00	-4.09
32.02	-4.39	31.72	-4.21
37.77	-4.61	37.52	-4.44
43.38	-4.65	43.25	-4.58
49.27	-4.98	49.07	-4.86
54.84	-5.02	54.65	-4.90
60.51	-5.05	60.15	-4.90
65.51	-4.52	65.53	-4.56
71.15	-4.63	71.08	-4.62
76.49	-4.53	76.49	-4.45
82.09	-4.61	82.14	-4.49
87.88	-4.74	87.80	-4.68

Sensor No. 2009

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
Starting date: 4/1/72		Starting date: 9/27/72	
-1.82	1.72	-2.45	2.03
3.69	1.77	3.33	1.95
9.08	1.90	8.96	1.96
14.41	2.14	14.24	2.22
19.82	2.26	19.82	2.26
25.57	2.07	25.75	1.98
31.12	2.07	31.16	2.04
36.85	1.87	36.99	1.80
42.60	1.69	42.74	1.61
48.33	1.50	48.40	1.47
53.99	1.43	54.02	1.41
59.44	1.51	59.54	1.46
64.95	1.53	64.94	1.53
70.45	1.58	70.50	1.56
75.78	1.83	75.85	1.79
81.42	1.72	81.38	1.74

Calibration correction values for atmospheric pressure (Continued)

$S_1 = 0.1389 \quad S_0 = 5.56$

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
Sensor No. 2009 (Continued)			
Starting date: 12/5/72		Starting date: 2/16/73	
-2.45	2.20	-2.14	2.03
3.33	2.13	3.34	2.12
8.96	2.03	8.94	2.10
14.24	2.23	14.39	2.26
19.82	2.21	19.91	2.34
25.75	1.90	25.73	2.09
31.16	1.99	31.24	2.06
36.99	1.74	36.98	1.83
42.74	1.52	42.80	1.59
48.40	1.44	48.37	1.55
54.02	1.41	53.99	1.48
59.54	1.38	59.61	1.43
64.94	1.50	65.02	1.55
70.50	1.51	70.54	1.54
75.85	1.76	75.84	1.78
81.38	1.78	81.35	1.76
Sensor No. 2010			
Starting date: 4/1/72		Starting date: 9/27/72	
-3.92	3.82	-3.92	3.47
1.69	3.77	1.69	3.20
7.67	3.31	7.67	2.77
13.61	2.94	13.61	2.43
19.58	2.50	19.58	2.00
25.52	2.12	25.52	1.58
31.19	2.00	31.19	1.48
37.02	1.70	37.02	1.12
43.17	1.12	43.17	0.57
48.97	0.86	48.97	0.09
54.97	0.45	54.97	-0.43
60.97	-0.01	60.97	-0.97
67.02	-0.53	67.02	-1.47
72.89	-0.85	72.89	-1.92
79.11	-1.49	79.11	-2.50
85.20	-2.05	85.20	-3.02

Calibration correction values for atmospheric pressure (Continued)

$S_1 = 0.1389 \quad S_0 = 5.56$

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
	Sensor No. 2010 (Continued)		
Starting date: 11/18/72		Starting date: 2/5/73	
-3.22	2.91	-2.79	2.69
2.97	2.41	3.14	2.32
8.82	2.04	9.07	1.91
14.67	1.75	14.93	1.62
26.69	0.93	32.64	0.55
32.23	0.77	38.68	0.04
38.30	0.25	44.86	-0.56
44.38	-0.29	50.91	-1.07
50.73	-0.97	57.32	-1.89
56.97	-1.69	63.46	-2.50
63.10	-2.30	69.55	-3.06
69.04	-2.78	75.57	-3.53
75.29	-3.38	81.53	-3.91
81.25	-3.76	87.61	-4.46
87.33	-4.31	93.59	-4.91
93.21	-4.71	99.73	-5.48
	Sensor No. 2011		
Starting date: 4/1/72		Starting date: 8/16/72	
-2.12	2.02	-2.57	2.24
3.61	1.85	3.14	2.10
9.23	1.75	8.63	2.06
14.62	1.93	13.69	2.38
20.25	1.83	19.30	2.31
25.59	2.05	24.86	2.40
31.18	2.01	30.40	2.40
36.99	1.73	35.73	2.39
42.55	1.74	41.02	2.50
47.91	1.92	46.67	2.52
53.45	1.97	51.78	2.80
59.11	1.84	57.22	2.81
64.03	2.45	62.50	3.12
69.86	2.17	68.00	3.14
75.35	2.26	72.84	3.50
80.83	2.31	78.17	3.63

Calibration correction values for atmospheric pressure (Continued)

$S_1 = 0.1389 \quad S_0 = 5.56$

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
Sensor No. 2011 (Continued)			
Starting date: 1/19/73		Starting date: 2/16/73	
-0.52	0.41	-0.63	0.47
5.05	0.35	4.95	0.46
10.43	0.45	10.39	0.57
16.20	0.34	16.01	0.44
21.78	0.28	21.61	0.39
27.19	0.36	27.15	0.47
32.93	0.22	32.77	0.34
38.35	0.25	38.36	0.36
44.07	0.20	44.01	0.26
49.63	0.20	49.57	0.23
55.28	0.11	55.22	0.17
60.79	0.17	60.56	0.28
66.28	0.18	66.13	0.27
71.70	0.25	71.62	0.37
77.20	0.38	77.02	0.50
82.56	0.51	82.54	0.59
Sensor No. 2011 (Continued)		Sensor No. 2012	
Starting date: 3/9/73		Starting date: 4/1/72	
-0.77	0.60	0.14	-0.24
4.61	0.68	5.42	0.04
10.18	0.70	10.99	0.00
15.96	0.56	16.47	0.08
21.54	0.50	21.87	0.21
27.11	0.51	27.48	0.16
32.77	0.42	33.07	0.12
38.35	0.36	38.70	0.02
44.06	0.26	44.60	-0.30
49.51	0.29	50.13	-0.29
55.16	0.23	55.93	-0.50
60.55	0.40	61.29	-0.33
66.05	0.39	66.59	-0.10
71.54	0.45	71.84	0.19
76.99	0.60	77.15	0.46
82.51	0.62	82.70	0.44

Calibration correction values for atmospheric pressure (Continued)

$S_1 = 0.1389 \quad S_0 = 5.56$

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
	Sensor No. 2013		
Starting date: 4/1/72		Starting date: 9/27/72	
-1.90	1.80	1.38	-1.48
3.63	1.83	7.45	-1.98
8.91	2.07	13.21	-2.22
14.43	2.12	19.30	-2.74
19.88	2.20	25.35	-3.26
25.06	2.58	31.12	-3.47
30.89	2.30	37.10	-3.90
36.62	2.10	43.04	-4.31
42.39	1.90	48.93	-4.63
47.98	1.85	54.65	-4.81
53.77	1.65	60.25	-4.82
59.01	1.94	65.66	-4.70
64.92	1.56	71.16	-4.67
70.13	1.90	76.15	-4.11
75.76	1.85	81.33	-3.71
81.48	1.66	86.67	-3.52
	Sensor No. 2014		
Starting date: 4/1/72		Starting date: 10/5/72	
1.02	-1.12	1.02	-1.28
7.09	-1.62	7.09	-1.77
13.12	-2.13	13.12	-2.22
18.54	-1.98	18.54	-2.18
24.45	-2.36	24.45	-2.61
30.40	-2.75	30.40	-2.87
36.24	-3.04	36.24	-3.25
42.18	-3.45	42.18	-3.57
48.05	-3.75	48.05	-3.87
53.60	-3.76	53.60	-3.93
59.18	-3.75	59.18	-3.84
64.61	-3.65	64.61	-3.70
69.93	-3.44	69.93	-3.52
75.13	-3.09	75.13	-3.18
80.48	-2.86	80.48	-2.99
85.89	-2.74	85.89	-2.83

Calibration correction values for atmospheric pressure (Continued)

$S_1 = 0.1389 \quad S_0 = 5.56$

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
	Sensor No. 2015		
Starting date: 4/1/72		Starting date: 8/24/72	
9.72	1.26	-1.27	1.21
15.57	0.98	4.34	1.19
21.08	1.00	9.72	1.26
26.41	1.23	15.41	1.07
32.27	0.92	20.91	1.08
37.98	0.74	26.43	1.22
43.43	0.86	32.07	1.03
49.07	0.76	37.80	0.83
54.47	0.95	43.36	0.90
59.87	1.08	48.87	0.87
65.39	1.09	54.46	0.96
70.85	1.18	60.01	1.01
76.48	1.13	65.31	1.13
82.09	1.05	70.92	1.15
87.51	1.16	76.42	1.16
93.23	1.01	82.02	1.09
Starting date: 1/19/73		Starting date: 3/2/73	
-1.27	1.10	-1.50	1.21
4.34	1.06	4.00	1.23
9.72	1.14	9.59	1.20
15.41	1.10	15.10	1.25
20.91	1.10	20.60	1.25
26.43	1.18	26.23	1.28
32.07	1.03	31.84	1.15
37.80	0.89	37.42	1.08
43.36	0.90	43.04	1.06
48.87	0.92	48.53	1.09
54.46	0.92	54.26	1.02
60.01	1.00	59.67	1.16
65.31	1.20	65.02	1.34
70.92	1.16	70.39	1.43
76.42	1.20	75.99	1.42
82.02	1.18	81.57	1.41

Calibration correction values for atmospheric pressure (Continued)

$S_1 = 0.1389 \quad S_0 = 5.56$

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
Sensor No. 2016			
Starting date: 4/1/72		Starting date: 8/17/72	
5.45	-5.55	5.45	-5.63
11.26	-5.79	11.26	-5.77
16.60	-5.61	16.60	-5.82
21.90	-5.34	21.90	-5.56
27.81	-5.72	27.81	-5.89
33.44	-5.79	33.44	-6.00
38.85	-5.65	38.85	-5.91
44.49	-5.76	44.49	-6.20
50.32	-6.02	50.32	-6.50
55.99	-6.15	55.99	-6.63
61.79	-6.36	61.79	-6.86
67.40	-6.44	67.40	-7.02
73.25	-6.76	73.25	-7.33
78.92	-6.88	78.92	-7.47
84.65	-7.03	84.65	-7.63
90.46	-7.31	90.46	-7.87
Sensor No. 2016 (Continued)		**Sensor No. 2017**	
Starting date: 10/11/72		Starting date: 4/1/72	
5.60	-6.22	11.26	-11.36
11.20	-6.35	15.08	-9.61
17.06	-6.49	18.92	-7.93
22.33	-6.23	22.93	-6.37
28.16	-6.50	26.92	-4.83
33.86	-6.71	30.92	-3.27
39.37	-6.62	34.58	-1.38
45.45	-7.06	39.11	-0.38
51.34	-7.64	43.32	0.97
56.97	-6.38	47.74	2.09
62.85	-7.76	52.32	3.10
68.61	-8.22	56.50	4.45
74.46	-8.48	60.41	6.07
80.12	-8.53	64.70	7.33
85.88	-8.61	68.58	9.03
91.61	-8.75	72.54	10.60

Calibration correction values for atmospheric pressure (Continued

$S_1 = 0.1389 \quad S_0 = 5.56$

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
Sensor No. 2017 (Continued)		Sensor No. 2018	
Starting date: 8/22/72		Starting date: 4/1/72	
-2.72	-4.37	-1.15	1.05
2.72	-4.30	4.39	1.07
8.24	-4.30	10.01	0.97
13.68	-3.68	15.47	1.08
19.36	-2.52	20.92	1.16
25.06	-1.48	26.50	1.14
30.79	-0.46	32.04	1.15
36.41	-0.66	37.64	1.08
42.00	1.42	43.32	0.97
47.52	2.17	48.82	1.01
53.17	2.81	54.40	1.02
58.55	3.85	60.11	0.84
64.13	4.76	65.59	0.89
69.58	5.94	71.00	1.03
75.32	6.99	76.53	1.08
80.86	8.14	82.13	1.01

Sensor No. 2018 (Continued)

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
Starting date: 8/14/72		Starting date: 10/18/72	
-1.15	0.82	-0.17	0.60
4.39	0.84	4.90	0.59
10.01	0.86	10.27	0.73
15.47	0.94	15.90	0.72
20.92	0.98	21.51	0.69
26.50	1.00	26.97	0.76
32.04	0.97	32.69	0.65
37.64	1.05	38.23	0.75
43.32	0.90	43.84	0.64
48.82	0.96	49.42	0.66
54.40	0.93	54.94	0.67
60.11	1.01	60.42	0.86
65.59	1.13	65.85	1.01
71.00	1.31	71.30	1.16
76.53	1.37	76.82	1.23
82.13	1.33	82.38	1.20

Calibration correction values for atmospheric pressure (Continued)

$S_1 = 0.1389 \quad S_0 = 5.56$

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
	Sensor No. 2018 (Continued)		
Starting date: 2/5/73		Starting date: 2/23/73	
-0.80	0.66	-0.80	0.57
4.81	0.61	4.81	0.60
10.36	0.66	10.36	0.62
15.90	0.65	15.90	0.65
21.39	0.63	21.39	0.66
26.91	0.70	26.91	0.66
32.62	0.54	32.62	0.54
38.05	0.58	38.05	0.57
43.81	0.47	43.81	0.47
49.34	0.45	49.34	0.49
54.98	0.46	54.98	0.43
60.44	0.52	60.44	0.51
65.79	0.66	65.79	0.70
71.25	0.76	71.25	0.79
76.70	0.85	76.70	0.92
82.21	0.85	82.21	0.97
	Sensor No. 2019		
Starting date: 4/1/72		Starting date: 8/24/72	
-0.29	0.19	-0.29	-0.03
5.10	0.36	5.10	0.10
10.79	0.19	10.79	0.06
16.34	0.21	16.34	-0.04
21.88	0.20	21.88	-0.08
27.61	0.03	27.61	-0.17
33.24	-0.04	33.24	-0.26
38.98	-0.25	38.98	-0.37
44.93	-0.63	44.93	-0.72
50.60	-0.76	50.60	-0.88
55.88	-0.45	55.88	-0.52
61.24	-0.28	61.24	-0.34
66.59	-0.10	66.59	-0.21
72.02	0.01	72.02	-0.07
77.46	0.15	77.46	0.05
82.86	0.28	82.86	0.17

Calibration correction values for atmospheric pressure (Continued)

$S_1 = 0.1389 \quad S_0 = 5.56$

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
	Sensor No. 2019 (Continued)		
Starting date: 12/6/72		Starting date: 2/7/73	
0.16	-0.72	1.08	-3.18
5.61	-0.59	6.48	-3.02
11.04	-0.53	11.99	-2.69
16.88	-0.62	17.46	-2.30
22.47	-0.60	22.89	-1.90
28.03	-0.58	28.43	-1.57
33.70	-0.71	34.13	-1.32
39.23	-0.72	39.67	-1.13
45.12	-0.90	45.29	-0.89
50.86	-1.08	50.99	-0.60
56.02	-0.69	56.20	-0.02
61.37	-0.46	61.48	0.53
66.81	-0.30	66.77	1.06
72.19	-0.13	72.15	1.58
77.65	0.03	77.51	2.03
83.08	0.12	82.97	2.36
Sensor No. 2019 (Continued)		Sensor No. 2020	
Starting date: 3/16/73		Starting date: 4/1/72	
4.75	-5.02	-0.18	0.08
9.91	-4.55	5.59	-0.12
14.77	-3.90	11.11	-0.12
19.67	-3.27	16.77	-0.21
24.65	-2.66	22.38	-0.29
29.72	-2.15	28.00	-0.35
34.78	-1.61	33.81	-0.61
39.88	-1.23	39.36	-0.63
45.07	-0.79	45.05	-0.75
49.57	0.01	50.65	-0.81
54.37	0.73	56.27	-0.84
59.15	1.53	61.63	-0.67
63.91	2.24	68.03	-1.54
68.67	3.05	72.63	-0.59
73.50	3.80	77.94	-0.32
78.43	4.39	83.48	-0.33

Calibration correction values for atmospheric pressure (Continued)

$S_1 = 0.1389 \quad S_0 = 5.56$

Sensor No. 2020 (Continued)

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
Starting date: 8/27/72		Starting date: 12/5/72	
-0.18	-0.05	0.09	-0.32
5.59	-0.21	5.67	-0.33
11.11	-0.18	11.22	-0.35
16.77	-0.22	16.79	-0.39
22.38	-0.34	22.48	-0.51
28.00	-0.41	28.12	-0.63
33.81	-0.61	33.81	-0.77
39.36	-0.66	39.42	-0.85
45.05	-0.78	45.12	-0.98
50.65	-0.87	50.77	-1.10
56.27	-0.90	56.38	-1.12
61.63	-0.70	61.69	-0.96
68.03	-1.12	67.22	-0.88
72.68	-0.59	72.64	-0.73
77.94	-0.32	77.95	-0.51
83.48	-0.34	83.50	-0.53
Starting date: 2/5/73		Starting date: 3/9/73	
0.35	-0.59	0.62	-0.73
5.84	-0.55	6.29	-0.77
11.46	-0.58	11.82	-0.76
17.12	-0.72	17.44	-0.89
22.73	-0.78	23.07	-0.95
28.45	-0.89	28.69	-1.01
34.13	-1.04	34.33	-1.14
39.75	-1.14	39.94	-1.24
45.44	-1.29	45.66	-1.40
51.11	-1.41	51.34	-1.53
56.72	-1.37	56.86	-1.43
62.15	-1.26	62.22	-1.29
67.52	-1.10	67.65	-1.16
72.89	-0.95	73.08	-1.04
78.30	-0.85	78.47	-0.93
83.86	-0.78	83.90	-0.80

Calibration correction values for atmospheric pressure (Continued)

$S_1 = 0.1389 \quad S_0 = 5.56$

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
	Sensor No. 2021		
Starting date: 4/1/72		Starting date: 9/27/72	
0.28	-0.72	0.28	-1.11
5.70	-0.65	5.70	-1.05
11.15	-0.53	11.15	-0.94
16.71	-0.42	16.71	-1.07
22.18	-0.39	22.18	-1.15
28.22	-0.60	28.22	-1.55
33.60	-0.51	33.60	-1.51
39.20	-0.53	39.20	-1.53
45.06	-0.75	45.06	-1.64
50.87	-0.87	50.87	-1.81
56.49	-0.94	56.49	-1.85
61.75	-0.75	61.75	-1.49
67.24	-0.72	67.24	-1.17
72.52	-0.55	72.52	-0.87
77.86	-0.33	77.86	-0.65
83.20	-0.12	83.20	-0.45
	Sensor No. 2022		
Starting date: 4/1/72		Starting date: 10/12/72	
-0.66	0.50	-0.79	0.62
4.80	0.54	4.81	0.65
10.41	0.45	10.51	0.52
15.76	0.56	16.01	0.66
21.50	0.47	21.57	0.54
26.94	0.55	27.03	0.65
32.61	0.50	32.49	0.64
37.98	0.56	37.99	0.73
43.55	0.53	43.61	0.71
49.30	0.47	49.00	0.69
54.80	0.50	54.75	0.64
60.25	0.55	60.18	0.74
65.87	0.49	65.50	0.80
71.28	0.57	71.55	0.62
76.61	0.75	76.48	1.06
82.19	0.76	82.07	1.01

Calibration correction values for atmospheric pressure (Continued)

$S_1 = 0.1389 \quad S_0 = 5.56$

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
Sensor No. 2022 (Continued)			
Starting date: 12/6/72		Starting date: 2/7/73	
-0.79	0.63	-0.68	0.45
4.81	0.54	5.03	0.36
10.51	0.52	10.40	0.47
16.01	0.55	15.99	0.43
21.57	0.52	21.55	0.39
27.03	0.55	27.14	0.37
32.49	0.59	32.72	0.35
37.99	0.65	38.14	0.47
43.61	0.62	43.72	0.47
49.00	0.74	49.18	0.53
54.75	0.61	54.87	0.49
60.18	0.71	60.30	0.53
65.50	0.84	65.78	0.58
71.55	0.65	71.20	0.70
76.48	1.01	76.71	0.82
82.07	1.01	82.20	0.86
Sensor No. 2023			
Starting date: 4/1/72		Starting date: 10/5/72	
-0.17	-0.50	0.80	-0.98
5.45	-0.48	6.31	-0.90
10.87	-0.32	11.60	-0.67
16.49	-0.31	17.02	-0.58
21.99	-0.17	22.51	-0.41
27.43	-0.12	27.91	-0.37
32.95	-0.01	33.35	-0.20
38.47	0.06	38.71	-0.05
44.11	0.02	44.17	0.00
49.52	0.20	49.63	0.14
55.22	0.22	55.08	0.30
60.72	0.30	60.33	0.49
66.29	0.24	65.80	0.48
71.65	0.52	71.30	0.68
77.22	0.57	76.53	0.91
82.72	0.69	81.95	1.06

Calibration correction values for atmospheric pressure (Continued)

$S_1 = 0.1389 \qquad S_0 = 5.56$

Sensor No. 2023 (Continued)

Pressure (mb-950)	Correction (mb)	Pressure (mb-950)	Correction (mb)
Starting date: 1/12/73		Starting date: 2/7/73	
0.80	-1.08	-0.29	-0.53
6.31	-1.02	5.34	-0.54
11.60	-0.80	10.84	-0.44
17.02	-0.68	16.39	-0.37
22.51	-0.60	21.88	-0.29
27.91	-0.43	27.51	-0.24
33.35	-0.30	33.08	-0.17
38.71	-0.15	38.55	-0.07
44.17	-0.06	44.18	-0.06
49.63	0.10	49.58	0.12
55.08	0.20	55.23	0.13
60.33	0.43	60.65	0.27
65.80	0.58	66.11	0.43
71.30	0.71	71.68	0.53
76.53	1.01	77.08	0.75
81.95	1.18	82.48	0.92

Sensor No. 2024

Starting date: 4/1/72

Pressure (mb-950)	Correction (mb)
0.33	-0.43
6.00	-0.53
11.37	-0.38
17.00	-0.44
22.51	-0.42
27.82	-0.17
33.40	-0.20
38.98	-0.25
44.56	-0.26
50.00	-0.16
55.62	-0.19
61.16	-0.20
66.69	-0.20
72.11	-0.07
77.69	-0.07
83.13	0.01

Calibration correction values for longwave radiometer (ly/min)

$S_1 = 0.0200$

Sensor No.	Starting date	Actual cell constant
5001	4/1/72	6.02
5002	4/1/72	5.20
	1/1/73	3.77
5003	4/1/72	5.33
5004	4/1/72	5.49
5005	4/1/72	5.05
5006	4/1/72	5.92
5007	4/1/72	5.23
5008	4/1/72	4.71
	1/1/73	4.59
5009	4/1/72	5.57
5010	4/1/72	5.18
5011	4/1/72	4.93
5012	4/1/72	4.54
5013	4/1/72	4.54
5014	4/1/72	5.43
5015	4/1/72	5.55
5016	4/1/72	4.87
5017	4/1/72	4.99

Calibration correction values for shortwave radiometer (ly/min)

$S_1 = 0.0100$

Sensor No.	Starting date	Actual cell constant
6001	4/1/72	6.83
6002	4/1/72	6.14
6003	4/1/72	5.28
6004	4/1/72	5.67
6005	4/1/72	6.24
6006	4/1/72	7.07
6007	4/1/72	6.04
6008	4/1/72	7.00
6009	4/1/72	6.86
6010	4/1/72	7.25
6011	4/1/72	7.01
6012	4/1/72	7.04
6013	4/1/72	6.32
6014	4/1/72	7.05
6015	4/1/72	7.06
6016	4/1/72	6.24
6017	4/1/72	6.30
6018	4/1/72	7.20

Calibration correction values for shortwave radiometer (ly/min) (Continued)

$S_1 = 0.0100$

Sensor No.	Starting date	Actual cell constant
6019	4/1/72	7.45
6020	4/1/72	8.15
6021	4/1/72	7.67
6022	4/1/72	7.06

Calibration correction values for wind direction (except buoys) (degrees of arc)

Sensor No.	Starting date	S_1	S_0
9001	5/9/72	0.5039	13.50
	1/23/72	0.5075	16.29
9002	5/3/72	0.5125	32.81
	1/8/73	0.5119	30.73
9003	5/2/72	0.4768	7.09
	7/31/72	0.5167	33.46
	1/16/73	0.4864	15.64
9004	6/5/72	0.4702	11.72
	1/3/73	0.4732	10.22
9005	6/20/72	0.4860	14.64
9006	9/27/72	0.4961	16.57
9007	6/7/72	0.5095	25.10
9008	4/28/72	0.4995	20.42
9009	5/4/72	0.4825	13.68
	2/13/73	0.4809	13.79
9010	5/11/72	0.4855	12.52
9011	1/25/73	0.4847	11.22
9012	1/3/73	0.4875	12.07

Calibration correction values for wind speed (m/s)

Sensor No.	Starting date	S_1	S_0
10001	4/1/72	0.0952	-0.11
10002	4/1/72	0.0956	-0.11
10003	4/1/72	0.0944	-0.11
10004	4/1/72	0.1030	-0.11
10005	4/1/72	0.1078	-0.11
10006	4/1/72	0.0945	-0.11
10007	4/1/72	0.0958	-0.11
10008	4/1/72	0.0974	-0.11
10009	4/1/72	0.0948	-0.11
10010	4/1/72	0.0953	-0.11

Calibration correction values for wind speed (m/s) (Continued)

Sensor No.	Starting date	S_1	S_0
10011	4/1/72	0.0976	-0.11
10012	4/1/72	0.0954	-0.11
10013	4/1/72	0.0938	-0.11
10014	4/1/72	0.0954	-0.11
10015	4/1/72	0.0952	-0.11
10016	4/1/72	0.0965	-0.11
10017	4/1/72	0.0953	-0.11
10018	4/1/72	0.0960	-0.11
10019	4/1/72	0.0951	-0.11
10020	4/1/72	0.0952	-0.11
10021	4/1/72	0.0953	-0.11
10022	4/1/72	0.0951	-0.11
10023	4/1/72	0.0956	-0.11
10024	4/1/72	0.0953	-0.11
10025	4/1/72	0.0959	-0.11
10026	4/1/72	0.0958	-0.11

Calibration correction values for water temperature (°C)

$S_1 = 0.0320 \quad S_0 = 2.00$

Sensor No.	Starting date	-5.00	0.00	5.00	10.00	15.00	20.00	25.00	30.00
11001	4/1/72	0.05	-0.05	-0.05	0.00	0.02	0.03	0.02	-0.02
11002	4/1/72	0.04	-0.06	-0.04	0.00	0.02	0.01	0.00	-0.06
11003	4/1/72	0.02	-0.08	-0.08	-0.04	0.00	0.00	-0.01	-0.05
11004	4/1/72	0.06	-0.05	-0.05	0.00	0.03	0.03	0.02	-0.02
11005	4/1/72	0.07	-0.02	-0.01	0.01	0.05	0.04	0.03	-0.02
11006	4/1/72	0.04	-0.06	-0.05	-0.02	0.01	0.02	0.00	-0.05
11007	4/1/72	0.04	-0.05	-0.04	-0.01	0.01	0.00	-0.03	-0.05
11008	4/1/72	0.01	-0.10	-0.10	-0.05	-0.01	-0.01	-0.02	-0.06
11009	4/1/72	0.05	-0.04	-0.04	0.00	0.02	0.02	0.01	-0.02
11010	4/1/72	0.02	-0.08	-0.08	-0.04	0.00	-0.01	-0.02	-0.06
11011	4/1/72	0.04	-0.05	-0.05	-0.02	0.02	0.02	0.00	-0.05
11012	4/1/72	0.03	-0.07	-0.07	-0.03	0.00	0.00	-0.01	-0.05
11013	4/1/72	0.05	-0.04	-0.02	0.01	0.03	0.03	0.00	-0.05
11014	4/1/72	0.06	-0.05	-0.04	0.00	0.03	0.03	0.01	-0.01
11015	4/1/72	0.04	-0.04	-0.02	0.01	0.02	0.02	-0.01	-0.07
11016	4/1/72	0.04	-0.06	-0.06	-0.02	0.02	0.01	0.00	-0.05
11017	4/1/72	0.05	-0.05	-0.04	0.00	0.00	0.02	0.00	-0.04
11018	4/1/72	0.06	-0.03	-0.02	0.05	0.06	0.04	0.02	-0.08
11019	4/1/72	0.03	-0.06	-0.06	-0.02	0.01	0.00	-0.02	-0.07
11020	4/1/72	-0.02	-0.11	-0.12	-0.05	-0.06	0.00	-0.06	-0.18
11021	4/1/72	0.06	-0.03	-0.02	0.01	0.04	0.04	0.00	-0.03
11022	4/1/72	0.04	-0.06	-0.07	-0.02	0.02	0.01	0.00	-0.05
11023	4/1/72	0.07	-0.02	-0.02	0.00	0.06	0.05	0.02	0.00

Calibration correction values for water temperature (°C) (Continued)

$S_1 = 0.0320 \quad S_0 = 2.00$

Sensor No.	Starting date	-5.00	0.00	5.00	10.00	15.00	20.00	25.00	30.00
11024	4/1/72	0.07	-0.02	-0.03	0.01	0.05	0.04	0.02	0.00
11025	4/1/72	0.05	-0.05	-0.04	0.00	0.03	0.03	0.00	-0.05
11026	4/1/72	0.00	-0.09	-0.09	-0.05	-0.02	-0.03	-0.04	-0.09
11027	4/1/72	0.00	-0.10	-0.09	-0.06	-0.03	-0.04	-0.04	-0.09
11028	4/1/72	0.04	-0.05	-0.04	0.00	0.02	0.01	0.00	-0.06
11029	4/1/72	0.06	-0.04	-0.04	0.00	0.03	0.04	0.03	0.00
11030	4/1/72	0.00	-0.11	-0.11	-0.06	-0.01	-0.01	-0.03	-0.07
11031	4/1/72	0.02	-0.08	-0.07	-0.03	0.00	0.00	-0.01	-0.06
11032	4/1/72	0.03	-0.08	-0.08	-0.02	0.00	0.01	0.00	-0.05
11033	4/1/72	0.06	-0.05	-0.04	0.00	0.03	0.04	0.03	-0.01
11034	4/1/72	0.02	-0.08	-0.08	-0.03	0.00	0.00	-0.01	-0.05
11035	4/1/72	0.09	-0.01	0.00	0.04	0.06	0.06	0.04	-0.01
11036	4/1/72	0.02	-0.08	-0.08	-0.03	0.00	0.00	-0.01	-0.07
11037	4/1/72	0.07	-0.03	-0.02	0.01	0.04	0.04	0.02	-0.02
11038	4/1/72	0.07	-0.03	-0.04	0.03	0.04	0.04	0.02	-0.01
11039	4/1/72	0.06	-0.05	-0.05	-0.01	0.03	0.04	0.02	-0.01
11040	4/1/72	0.05	-0.06	-0.06	-0.02	0.01	0.02	0.01	-0.02
11041	4/1/72	0.04	-0.06	-0.07	-0.02	0.01	0.02	0.00	-0.02
11042	4/1/72	0.05	-0.06	-0.05	-0.02	0.01	0.02	0.01	-0.03
11043	4/1/72	0.05	-0.05	-0.05	-0.01	0.02	0.02	0.01	-0.02
11044	4/1/72	0.05	-0.04	-0.04	0.00	0.03	0.02	0.00	-0.04
11045	4/1/72	0.03	-0.08	-0.06	-0.02	0.00	0.00	0.00	-0.06
11046	4/1/72	0.05	-0.05	-0.04	0.00	0.03	0.03	0.00	-0.04
11047	4/1/72	0.04	-0.05	-0.04	0.00	0.02	0.01	-0.01	-0.06
11048	4/1/72	0.03	-0.05	-0.04	0.00	0.01	0.00	-0.03	-0.07
11049	4/1/72	0.04	-0.07	-0.08	-0.03	0.01	0.01	0.00	-0.03
11050	4/1/72	0.09	0.00	0.00	0.04	0.06	0.06	0.03	0.00
11051	4/1/72	0.04	-0.05	-0.05	-0.02	0.02	0.01	-0.01	-0.04
11052	4/1/72	0.02	-0.07	-0.06	-0.02	0.00	0.00	-0.02	-0.06
11053	4/1/72	0.02	-0.08	-0.08	-0.04	0.00	0.00	-0.03	-0.06
11054	4/1/72	0.05	-0.05	-0.04	0.00	0.03	0.03	0.00	-0.02
11055	4/1/72	0.07	-0.02	-0.01	0.02	0.05	0.04	0.01	-0.01
11056	4/1/72	0.03	-0.08	-0.06	-0.02	0.00	0.00	-0.04	0.01
11057	4/1/72	0.14	0.14	0.12	0.14	0.08	0.07	0.03	0.00
11058	4/1/72	-0.03	-0.12	-0.11	-0.07	-0.05	-0.06	-0.09	-0.14
11059	4/1/72	0.05	-0.05	-0.05	0.00	0.01	0.02	0.00	-0.02
11060	4/1/72	0.02	-0.09	-0.08	-0.04	-0.01	0.00	-0.03	-0.05
11061	4/1/72	0.02	-0.08	-0.08	-0.02	-0.01	0.00	-0.02	-0.05
11062	4/1/72	0.02	-0.08	-0.08	-0.03	0.00	0.00	-0.02	-0.05
11063	4/1/72	0.04	-0.05	-0.05	-0.01	0.00	0.04	-0.02	-0.04
11064	4/1/72	0.00	-0.11	-0.10	-0.06	-0.02	-0.03	-0.05	-0.08
11065	4/1/72	0.02	-0.08	-0.09	-0.04	0.00	0.00	-0.03	-0.06
11066	4/1/72	0.02	-0.08	-0.07	-0.03	0.00	0.00	-0.02	-0.05
11067	4/1/72	0.02	-0.08	-0.09	-0.04	0.00	0.00	-0.03	-0.06
11068	4/1/72	0.04	-0.05	-0.05	-0.01	0.00	0.02	0.00	-0.03

Calibration correction values for water temperature (°C) (Continued)

$S_1 = 0.0320 \quad S_0 = 2.00$

Sensor No.	Starting date	-5.00	0.00	5.00	10.00	15.00	20.00	25.00	30.00
11069	4/1/72	0.05	-0.05	-0.04	-0.01	0.02	0.02	0.00	-0.03
11070	4/1/72	-0.01	-0.11	-0.10	-0.06	-0.02	-0.04	-0.04	-0.12
11071	4/1/72	-0.01	-0.09	-0.10	-0.05	-0.02	-0.03	-0.07	-0.11
11073	4/1/72	0.07	-0.04	-0.04	0.00	0.04	0.03	0.02	0.00
11074	4/1/72	0.02	-0.11	-0.10	-0.07	0.00	0.00	-0.01	-0.04
11075	4/1/72	0.00	-0.10	-0.10	-0.05	-0.02	-0.01	-0.04	-0.07
11076	4/1/72	0.05	-0.05	-0.04	0.00	0.03	0.02	0.00	-0.03
11077	4/1/72	0.02	-0.08	-0.08	-0.03	0.00	0.00	-0.01	-0.06
11078	4/1/72	0.10	-0.02	0.20	0.02	0.05	0.05	0.02	-0.01
11079	4/1/72	0.05	-0.05	-0.04	0.00	0.02	0.02	0.00	-0.03
11080	4/1/72	0.02	-0.08	-0.08	-0.03	0.00	0.00	-0.03	-0.07
11081	4/1/72	0.06	-0.05	-0.04	0.00	0.03	0.04	0.01	-0.02
11082	4/1/72	0.00	-0.09	-0.07	-0.03	-0.01	-0.03	-0.04	-0.13
11083	4/1/72	-0.01	-0.12	-0.11	-0.07	-0.04	-0.04	-0.06	-0.10
11084	4/1/72	0.01	-0.09	-0.08	-0.04	-0.01	0.00	-0.04	-0.08
11085	4/1/72	0.02	-0.06	-0.03	0.00	0.01	0.00	-0.04	-0.10
11086	4/1/72	0.07	-0.04	-0.03	0.01	0.04	0.05	0.02	0.00
11087	4/1/72	0.04	-0.08	-0.09	-0.03	0.01	0.03	0.00	-0.02
11088	4/1/72	0.04	-0.07	-0.07	-0.02	0.01	0.02	0.00	0.00
11089	4/1/72	0100	-0.10	-0.10	-0.06	-0.02	-0.01	-0.03	-0.06
11090	4/1/72	0.03	-0.08	-0.08	-0.03	0.00	0.01	-0.01	-0.05
11091	4/1/72	0.01	-0.09	-0.09	-0.04	-0.01	0.00	-0.03	-0.06
11092	4/1/72	-0.02	-0.14	-0.14	-0.09	-0.05	-0.05	-0.03	-0.11
11093	4/1/72	0.00	-0.11	-0.11	-0.06	-0.03	-0.02	-0.04	-0.07
11094	4/1/72	0.02	-0.09	-0.09	-0.04	0.00	0.00	-0.01	-0.06
11095	4/1/72	0.03	-0.06	-0.04	-0.02	0.01	0.00	-0.03	-0.06
11096	4/1/72	-0.01	-0.12	-0.12	-0.08	-0.04	-0.04	-0.06	-0.09
11097	4/1/72	0.01	-0.09	-0.08	-0.04	-0.01	0.00	-0.03	-0.06
11098	4/1/72	0.01	-0.09	-0.08	-0.03	0.00	0.00	-0.03	-0.08
11099	4/1/72	0.01	-0.07	-0.05	-0.02	0.00	0.00	-0.04	-0.09
11100	4/1/72	0.06	-0.05	-0.04	0.00	0.04	0.03	0.01	0.00
11101	4/1/72	0.02	-0.09	-0.09	-0.04	0.00	0.00	-0.02	-0.04
11102	4/1/72	0.01	-0.10	-0.09	-0.05	-0.01	-0.01	-0.03	-0.06
11103	4/1/72	0.05	-0.06	-0.05	-0.01	0.02	0.03	0.00	-0.02
11104	4/1/72	0.01	-0.08	-0.07	-0.03	-0.01	0.00	-0.04	-0.08
11105	4/1/72	0.02	-0.07	-0.06	-0.03	0.00	0.00	-0.04	-0.08
11106	4/1/72	0.05	-0.05	-0.04	0.00	0.03	0.03	0.00	-0.03
11107	4/1/72	0.06	-0.04	-0.03	0.00	0.03	0.03	0.00	-0.02
11108	4/1/72	0.05	-0.05	-0.04	0.00	0.03	0.03	0.00	-0.02
11109	4/1/72	0.06	-0.03	-0.01	0.00	0.05	0.03	0.00	-0.01
11110	4/1/72	0.05	-0.04	-0.03	-0.01	0.03	0.02	0.00	-0.03
11111	4/1/72	0.05	-0.04	-0.03	0.00	0.03	0.03	0.00	-0.03
11112	4/1/72	0.02	-0.08	-0.07	-0.03	0.00	0.00	-0.02	-0.06
11114	4/1/72	0.08	-0.02	-0.01	0.02	0.06	0.06	0.03	0.00
11115	4/1/72	0.04	-0.06	-0.05	-0.01	0.02	0.00	0.00	-0.05

Calibration correction values for water temperature (°C) (Continued)

$S_1 = 0.0320 \quad S_0 = 2.00$

Sensor No.	Starting date	-5.00	0.00	5.00	10.00	15.00	20.00	25.00	30.00
11116	4/1/72	0.07	-0.03	-0.01	0.00	0.05	0.04	0.02	-0.01
11117	4/1/72	0.07	-0.04	-0.03	0.01	0.04	0.03	0.02	-0.01
11118	4/1/72	0.04	-0.05	-0.04	0.00	0.02	0.02	0.00	-0.04
11119	4/1/72	0.03	-0.07	-0.06	-0.02	0.01	0.01	-0.01	-0.06
11120	4/1/72	0.00	-0.11	-0.10	-0.06	-0.02	-0.02	-0.05	-0.08
11121	4/1/72	0.03	-0.08	-0.07	-0.02	0.01	0.01	-0.01	-0.05
11122	4/1/72	0.05	-0.06	-0.04	0.00	0.03	0.03	0.00	-0.03
11123	4/1/72	0.07	-0.03	-0.02	0.01	0.04	0.03	0.02	-0.01
11124	4/1/72	0.01	-0.09	-0.08	-0.03	-0.01	-0.01	-0.03	-0.08
11125	4/1/72	0.02	-0.06	-0.05	-0.03	-0.02	-0.02	-0.04	-0.06
11126	4/1/72	0.01	-0.07	-0.06	-0.02	0.00	0.00	-0.03	-0.09
11127	4/1/72	0.01	-0.08	-0.06	-0.02	0.00	0.00	-0.03	-0.09
11128	4/1/72	0.00	-0.11	-0.12	-0.05	-0.04	-0.05	-0.03	-0.11
11129	4/1/72	0.05	-0.05	-0.04	0.00	0.02	0.03	0.01	-0.04
11130	4/1/72	0.03	-0.05	-0.04	0.00	0.01	0.01	-0.01	-0.06
11131	4/1/72	0.03	-0.07	-0.08	-0.02	0.01	0.01	0.00	-0.04
11132	4/1/72	0.01	-0.08	-0.08	-0.04	-0.01	-0.02	-0.04	-0.07
11133	4/1/72	0.07	-0.03	-0.02	0.02	0.04	0.04	0.02	-0.02
11134	4/1/72	0.05	-0.04	-0.03	0.00	0.02	0.02	-0.01	-0.06
11135	4/1/72	0.06	-0.05	-0.05	-0.01	0.03	0.04	0.02	-0.01
11136	4/1/72	0.05	-0.05	-0.05	0.00	0.02	0.02	0.00	-0.03
11138	4/1/72	0.07	-0.03	-0.03	0.01	0.04	0.04	0.02	-0.01
11142	4/1/72	0.07	-0.03	-0.02	0.02	0.05	0.05	0.02	-0.02
11147	4/1/72	0.06	-0.05	-0.04	0.00	0.04	0.03	0.02	0.00
11148	4/1/72	0.09	-0.03	0.19	0.01	0.04	0.03	0.01	-0.02
11149	4/1/72	0.04	-0.07	-0.06	-0.01	0.01	0.02	0.00	-0.04
11150	4/1/72	0.06	-0.04	-0.02	0.01	0.04	0.04	0.00	-0.04
11151	4/1/72	0.02	-0.08	-0.07	-0.02	0.00	0.00	-0.03	-0.07
11152	4/1/72	0.05	-0.06	-0.05	-0.01	0.02	0.03	0.00	-0.03
11153	4/1/72	0.02	-0.08	-0.08	-0.03	0.00	0.00	-0.02	-0.05
11154	4/1/72	0.05	-0.05	-0.05	-0.01	0.02	0.03	0.00	-0.03
11155	4/1/72	0.06	-0.05	-0.05	0.00	0.04	0.03	0.02	0.00
11156	4/1/72	0.04	-0.06	-0.05	0.00	0.01	0.01	-0.01	-0.05
11157	4/1/72	-0.02	-0.12	-0.10	-0.07	-0.04	-0.05	-0.02	-0.12
11158	4/1/72	0.00	-0.09	-0.06	-0.02	-0.01	-0.02	-0.07	-0.13
11159	4/1/72	0.03	-0.06	-0.05	-0.01	0.01	0.01	-0.01	-0.06
11160	4/1/72	-0.03	-0.12	-0.09	-0.06	-0.05	-0.06	-0.10	-0.16
11161	4/1/72	0.07	-0.01	-0.01	0.00	0.02	0.03	0.02	0.00
11162	4/1/72	0.06	0.00	0.00	-0.04	0.00	0.00	0.00	0.00
11163	4/1/72	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11164	4/1/72	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11165	4/1/72	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11166	4/1/72	0.08	0.01	0.00	-0.02	0.01	0.02	0.02	0.03
11167	4/1/72	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11168	4/1/72	0.06	-0.01	0.00	-0.05	0.00	0.00	0.00	0.00

Calibration correction values for water temperature (°C) (Continued)

$S_1 = 0.0320 \quad S_0 = 2.00$

Sensor No.	Starting date	-5.00	0.00	5.00	10.00	15.00	20.00	25.00	30.00
11169	4/1/72	0.08	-0.01	0.00	0.01	0.04	0.04	-0.02	0.00
11170	4/1/72	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11171	4/1/72	0.01	-0.01	-0.08	-0.03	-0.01	-0.01	-0.04	-0.08
11172	4/1/72	0.03	-0.01	-0.06	-0.02	0.00	0.00	-0.04	-0.08
11173	4/1/72	-0.02	-0.02	-0.12	-0.08	-0.06	-0.07	-0.11	-0.15
11174	4/1/72	-0.03	-0.02	-0.12	-0.09	-0.07	-0.08	-0.12	-0.14
11175	4/1/72	0.03	0.01	-0.09	-0.05	-0.01	0.00	-0.02	-0.05
11176	4/1/72	0.07	0.00	-0.02	0.00	0.04	0.04	0.00	-0.02
11177	4/1/72	0.04	0.00	-0.06	-0.02	0.00	0.01	-0.01	-0.05
11178	4/1/72	0.03	0.00	-0.08	-0.04	0.00	0.00	-0.02	-0.05
11179	4/1/72	0.01	0.00	-0.08	-0.04	-0.02	-0.01	-0.04	-0.08
11180	4/1/72	0.05	0.00	-0.04	0.00	0.01	0.01	-0.01	-0.05
11181	4/1/72	0.02	-0.08	-0.08	-0.03	0.00	0.00	-0.02	-0.05
11182	4/1/72	0.08	-0.01	0.00	0.03	0.06	0.05	0.03	0.00
11183	4/1/72	0.06	-0.04	-0.03	0.00	0.03	0.03	0.00	-0.03
11184	4/1/72	-0.04	-0.13	-0.13	-0.09	-0.08	-0.08	-0.12	-0.15
11185	4/1/72	0.02	-0.07	-0.06	-0.02	0.00	0.00	-0.03	-0.07
11186	4/1/72	0.05	-0.04	-0.03	0.01	0.03	0.02	0.00	-0.05
11187	4/1/72	0.04	-0.05	-0.04	0.00	0.02	0.02	0.00	-0.04

Calibration correction values for water temperature (evaporation pan) (°C)

Sensor No.	Starting date	S_1	S_0	-5.00	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00
12143	4/1/72	0.0420	2.00	0.04	-0.06	-0.06	-0.01	0.01	0.02	-0.01	-0.04	-0.06	-0.05	0.04
12145	4/1/72	0.0320	2.00	0.07	-0.04	-0.03	0.01	0.04	0.04	0.02	-0.02	-0.03	-0.02	0.07

APPENDIX VI

Station Position Corrections

APPENDIX VI

Station Position Corrections

IFYGL station No.	Sensor position No.	Sensor No.	Starting date	Starting time (GMT)	Station position correction (° of arc)
			Dewpoint		
12	15	7002	6/13/72	1748	-0.03
13	15	7004	5/26/72	0230	0.00
14	15	7019	6/14/72	2000	0.00
15	15	7023	7/18/72	1700	-0.02
16	15	7017	5/23/72	2100	0.00
17	15	7009	6/15/72	2100	-0.43
	15	7009	7/11/72	1740	0.00
18	15	7016	7/19/72	1600	-0.50
19	15	7012	6/6/72	1800	-0.47
20	15	7001	5/31/72	1818	0.00
21	15	7011	6/7/72	1600	-0.44
22	06	7022	5/9/72	1715	-1.43
23	42	7005	6/29/72	1847	-1.67
24	13	7013	6/16/72	1628	-0.07
25	06	7010	5/4/72	1810	-1.16
	06	7020	6/21/72	1900	-1.16
	06	7010	8/18/72	1415	-1.16
26	42	7008	5/18/72	1930	0.00
27	13	7003	6/5/72	1750	-0.38
	13	7003	7/24/72	1533	0.09
	13	7003	8/24/72	1835	-0.03
28	06	7018	4/28/72	2100	-1.94
29	06	7006	5/2/72	1835	-1.47
30	05	7015	9/27/72	2130	0.00
	05	7026	11/30/72	2100	0.00
30	13	7021	9/27/72	2130	0.00
	13	7013	1/25/73	1718	0.00
31	06	7014	5/11/72	1845	-2.15
	06	7023	12/1/72	1744	-2.15
	06	7012	1/23/73	1548	-2.15
			Wind direction (except buoys)		
22	03	9001	5/9/72	1715	-12.14
	03	9012	1/3/73	1811	-9.89
23	39	9003	7/31/72	1615	-13.51
24	10	9005	6/21/72	1612	-8.80
25	03	9009	5/4/72	1810	-9.88
	03	9004	1/3/73	2142	-9.67

Station Position Corrections (Continued)

IFYGL station No.	Sensor position No.	Sensor No.	Starting date	Starting time (GMT)	Station position correction (° of arc)
		Wind direction (except buoys) (continued)			
26	39	9002	5/18/72	1930	2.68
	39	9002	8/24/72	1430	-10.10
27	10	9004	6/5/72	1750	0.00
	10	9004	8/24/72	1835	-18.03
28	03	9008	4/28/72	2100	89.35
	03	9008	5/1/72	1330	-16.65
	03	9002	1/8/73	2040	-11.76
	03	9002	2/2/73	1630	-7.10
29	03	9003	5/2/72	1835	-13.87
	03	9007	6/7/72	1945	-12.42
	03	9003	1/16/73	1710	-7.97
30	10	9006	9/27/72	2130	-1.94
	10	9011	1/25/73	1718	-14.64
31	03	9010	5/11/72	1845	-13.57
	03	9001	1/23/73	1548	-12.11
	03	9003	2/13/73	1948	-2.32
		Current meter (towers)			
23	05	15013	10/13/72	1600	2.70
	07	15008	6/29/72	1847	2.70
	10	15012	6/29/72	1847	2.70
	13	15011	6/29/72	1847	2.70
24	02	15009	6/20/72	1845	1.60
	05	15010	6/20/72	1845	1.60
26	02	15005	5/16/72	2030	-0.90
	05	15001	5/16/72	2030	-0.90
	07	15003	5/16/72	2030	-0.90
	10	15002	5/16/72	2030	-0.90
	13	15004	5/16/72	2030	-0.90
27	02	15006	5/6/72	1750	-14.00
	05	15007	5/6/72	1750	-14.00

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